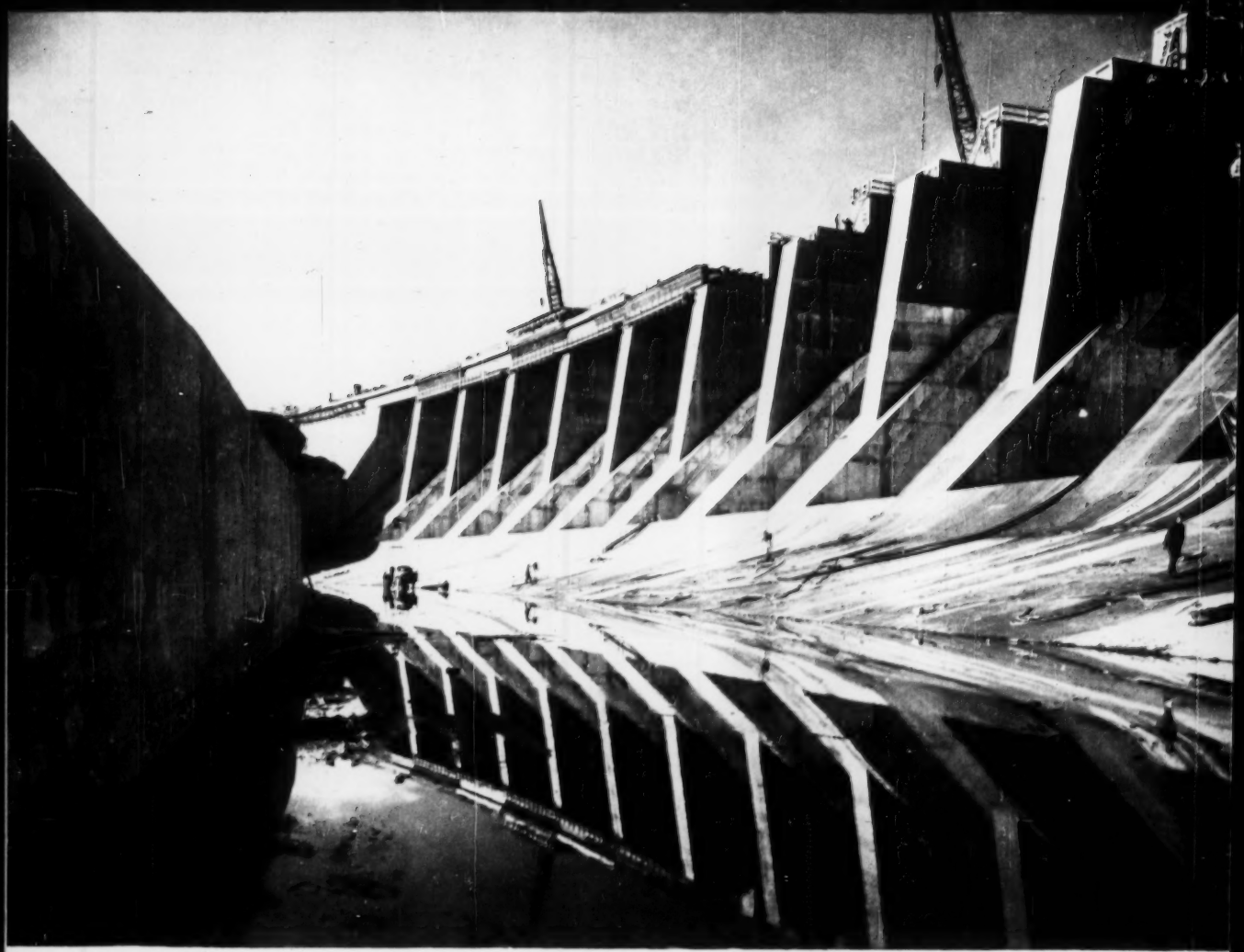
ENGINEERING NEWS-RECORD



Where concrete reflects U. S. - vs - Canadian thinking p. 28

A McGRAW-HILL PUBLICATION

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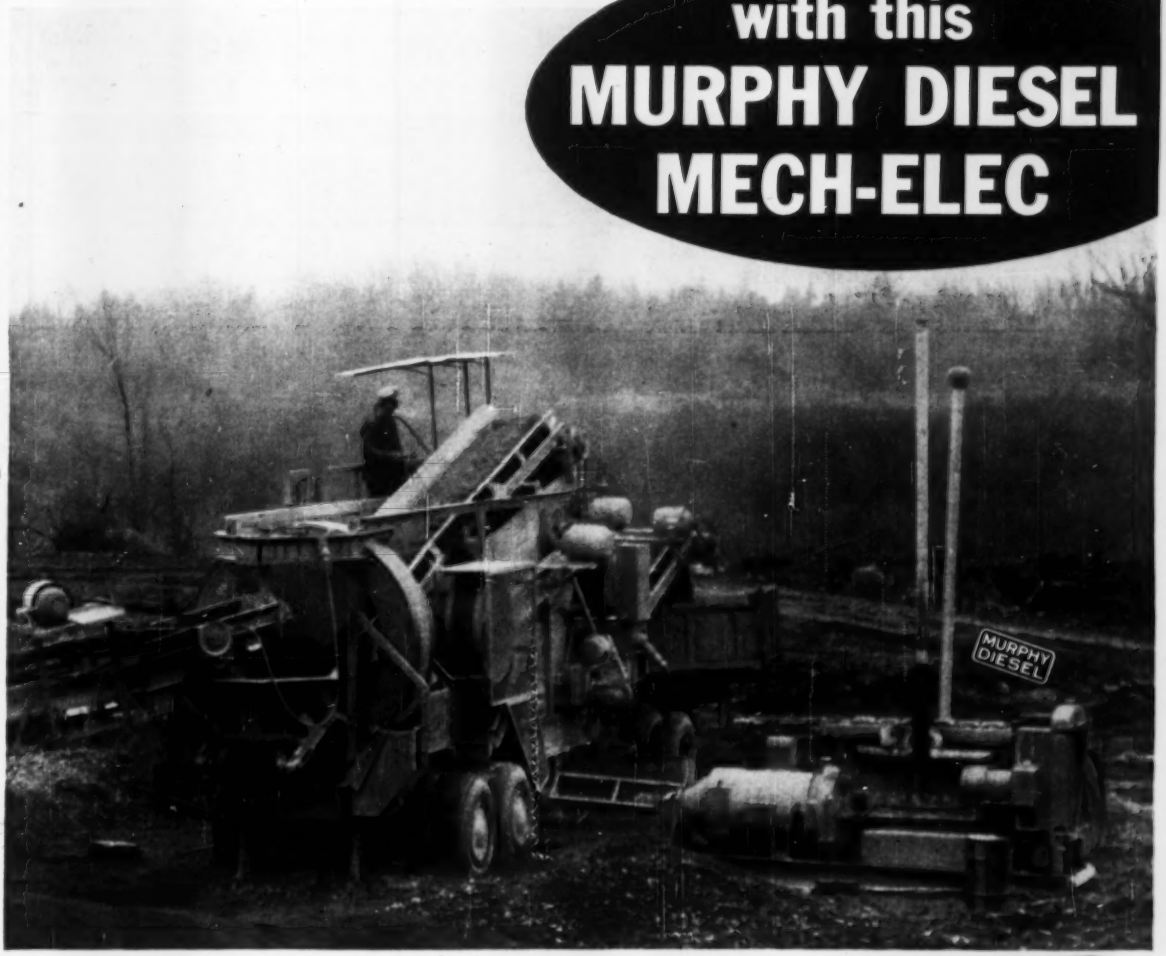
SUPERIOR

CONTINUOUS THREADED COIL RODS . . .

Menard Construction Company Gets *BOTH*...

with this MURPHY DIESEL MECH-ELEC



For turning glacial till into specification aggregate by the most modern and efficient method, Menard Construction Company, of Green Valley, Ontario, powers their crushing plant with a Murphy Diesel Model 124 Mech-Elec Unit. *This single, compact power package supplies both heavy-duty mechanical power for the crusher and low-cost electric power for conveyor drives and screens, either simultaneously or separately.*

Whatever type of power . . . mechanical, electric, or both . . . is best for your job, Murphy Diesel engines, generator sets or Mech-Elec Units give you the economy of operation and dependability in heavy-duty service that keeps profits high and costs low. Ask your Murphy Diesel Dealer to recommend the Murphy unit best suited to your needs.

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HEAVY-DUTY POWER for Construction

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

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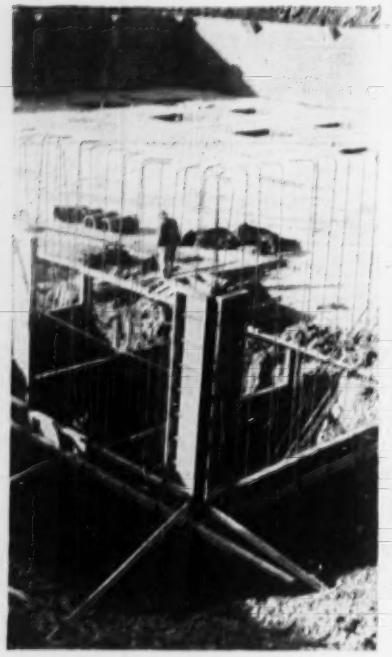

Contractor Saves 40% with Symons Forms . . .

7,500 square feet of Symons Standard Forms were used in the new 2 million gallon capacity pumping station at Melrose Park, Illinois. 2,000 cubic yards of concrete were used on the job and the concrete contractor, Louis Macro Company, Melrose Park, reported a 40 per cent saving through the use of Symons Forms. Walls for the job were completed in three pours.

Symons engineering service can help you realize substantial savings in forming. With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Our field service representatives are sales engineers, ready and able to advise you on form erection, pouring and stripping methods that will help you save time, labor and materials. You can call on them to assist you on any forming problems.

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Sam Carniglia Company, Melrose Park, Illinois
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EIGHTY-SECOND YEAR OF PUBLICATION

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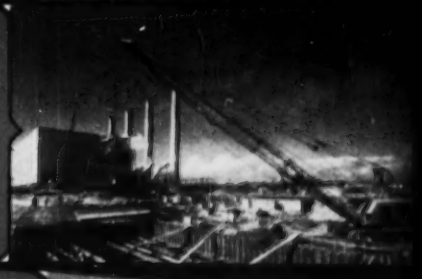

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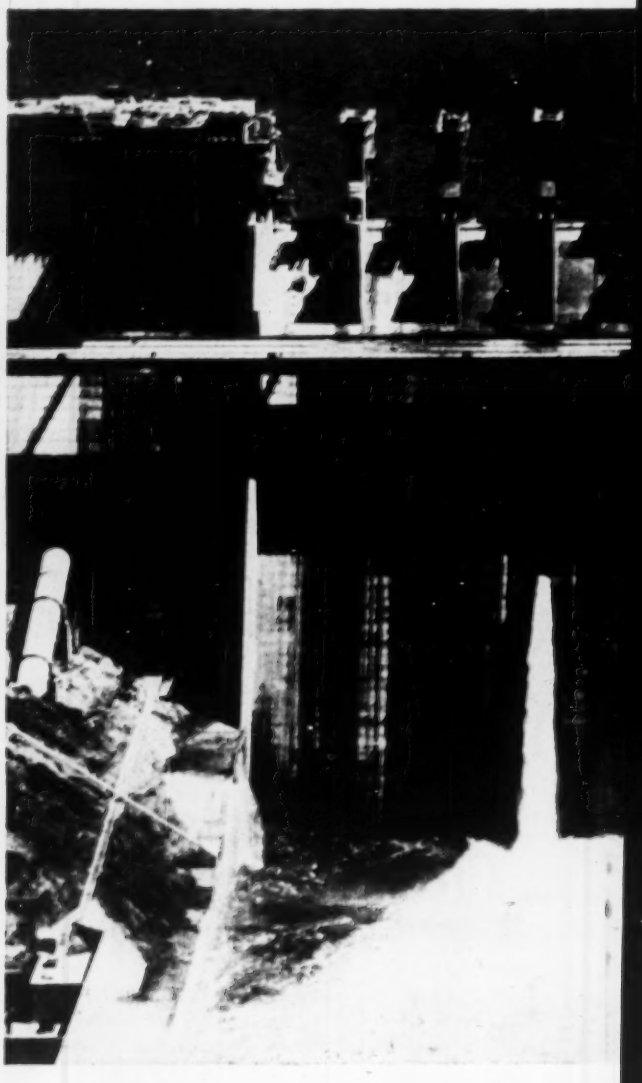
helped build world's largest earthfill and concrete dam



By helping to keep a vast array of earth moving and other equipment on the job and running dependably, Texaco Lubricants and Lubrication Engineering Service played an important part in the construction of Folsom Dam, Folsom, California.

Equipment maintenance men there were particularly pleased with Texaco performance. For example—

TEXACO MARFAK—for its ability to protect chassis parts against wear and rust and to stay on the job in spite of heavy loads, jolts, dust and mud.

TEXACO MARFAK HEAVY DUTY—for its ability to seal dirt and moisture out of wheel bearings, to give longer lasting protection with no seasonal change required.

TEXACO ROCK DRILL LUBRICANT EP—for its ability to lubricate effectively and prevent rust whether drills are running or idle.

TEXACO TRACK ROLL LUBRICANT—for the long-lasting protection it gives rollers even under severest conditions.

The foregoing are just four of the six basic Texaco Lubricants used in the Texaco Simplified Lubrication Plan to handle *all* major lubrication. Texaco

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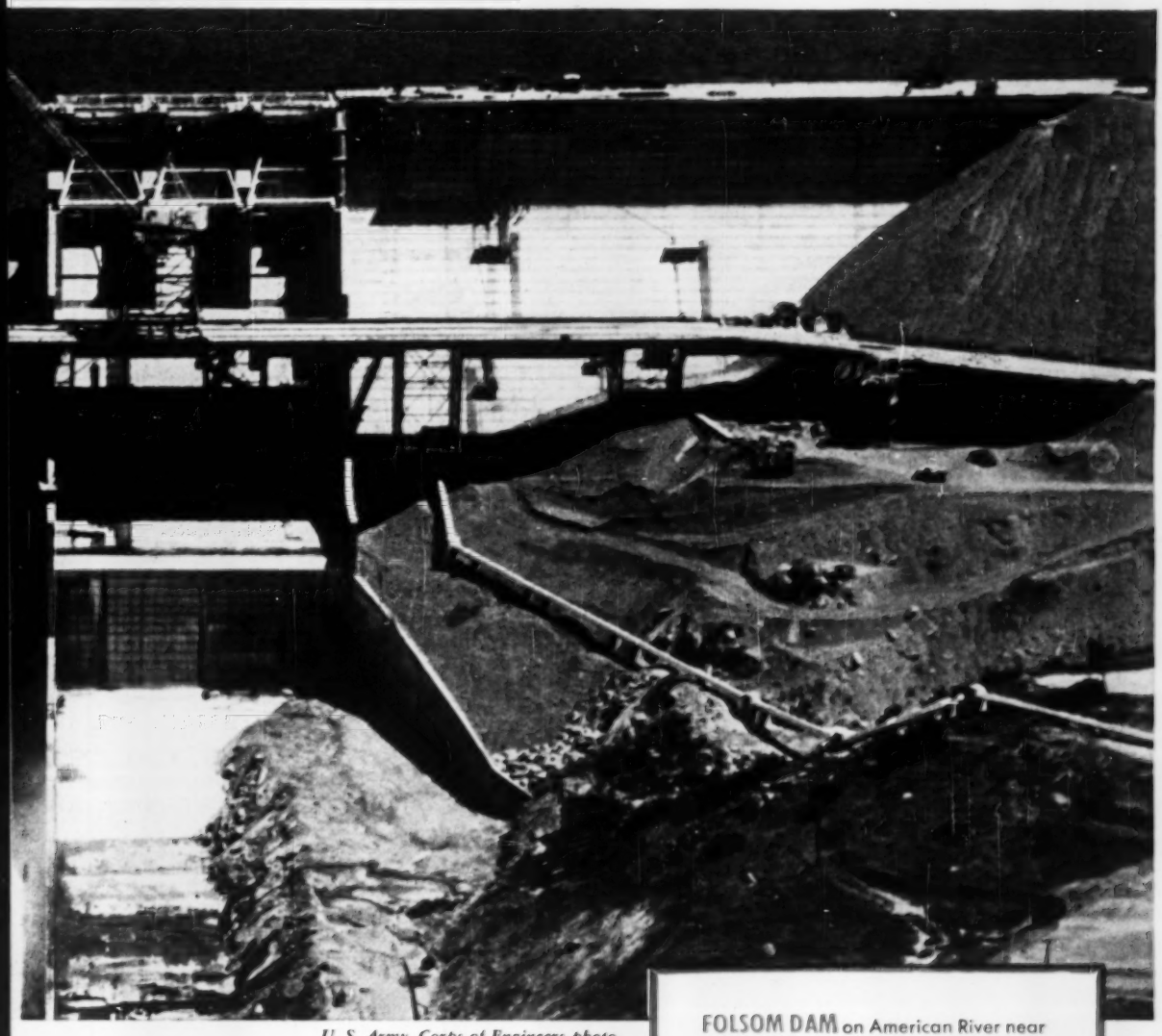

U. S. Army, Corps of Engineers photo

FOLSOM DAM on American River near Folsom, California. Merritt-Chapman & Scott Corporation and The Savin Construction Corporation, contractors for main dam *(shown)*, credit Texaco Lubricants and Lubrication Engineering Service with a big assist in keeping construction equipment working dependably and maintenance costs low.

Lubrication Engineering Service will gladly develop a specific Plan to meet your requirements and help you simplify and improve your maintenance lubrication.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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Time and again, comparison cost studies have proved the economy of reinforced concrete. Equally important, reinforced concrete bridges and overpasses start quicker . . . are completed sooner because all necessary materials and labor are readily available from local sources.

Reinforced concrete has many other advantages as well. No other method of construction is so flexible. No other construction medium permits so infinite a variety of imaginative and beautiful designs.

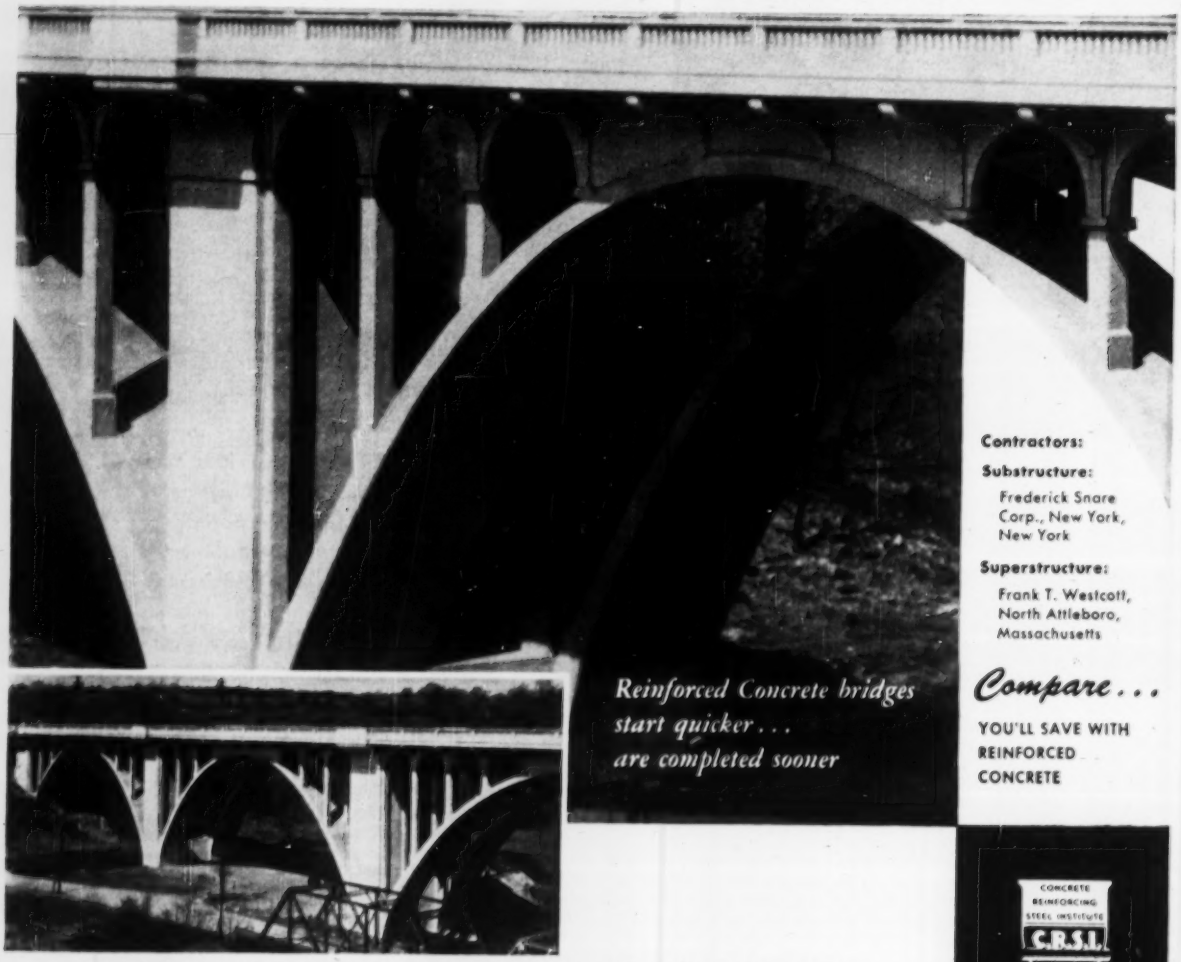
Structures built with reinforced concrete are rugged, too . . . highly resistant to wind, shock, and quake. They are lower in first cost . . . more weather resistant, and require less maintenance. On your next bridge or overpass . . . design for reinforced concrete.

bridge appropriation dollars go further with . . .

REINFORCED CONCRETE

Ashton Reinforced Concrete Viaduct carrying R. I. State Route 116, The George Washington Highway, over the Blackstone River Valley

Designed by the Rhode Island Division of Roads and Bridges



Reinforced Concrete bridges start quicker . . . are completed sooner

Contractors:

Substructure:

Frederick Snare Corp., New York, New York

Superstructure:

Frank T. Westcott, North Attleboro, Massachusetts

Compare . . .

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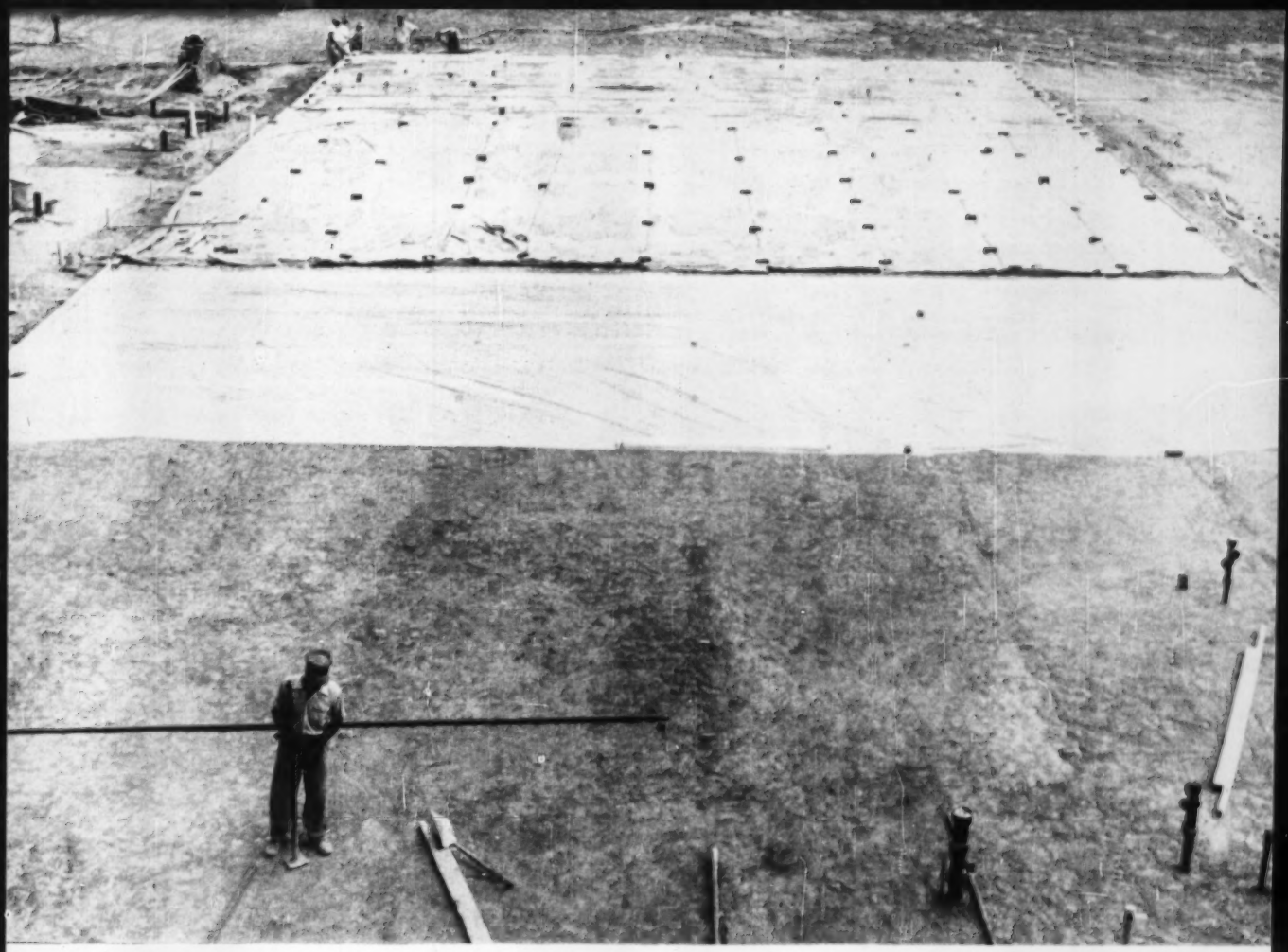

Extra wide film (to 32 ft. in width) covers large areas quickly. Lightweight (1000 sq. ft. of 4 mil film weighs less than 20 lb!) makes handling easy. Photo shows VISQUEEN film made by **The Visking Corporation,** Terre Haute, Ind.

Blanket of Polyethylene brings

stronger, even cure...no need to wet down

Here's an easy way to cut construction time and increase profit. Lightweight film made of BAKELITE Brand Polyethylene is laid over green cement quickly and easily without marring the surface. Moisture is kept in . . . no more need for wetting down during cure. And you can use the film over and over again.

This is only one of the many ways you can put polyethylene film to work to your advantage. Lay it under slabs or foundations as a moisture barrier . . . as a dust and moisture barrier under subflooring . . . as flashing around doors and windows. And it's just the thing for covering finished millwork, stacked cement and other materials subject to water damage, or for temporary windbreaks and glazing during construction.

It pays to use materials made of

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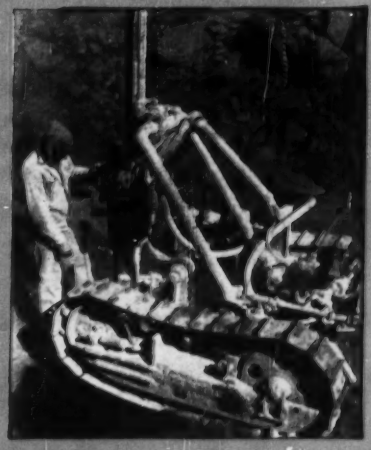

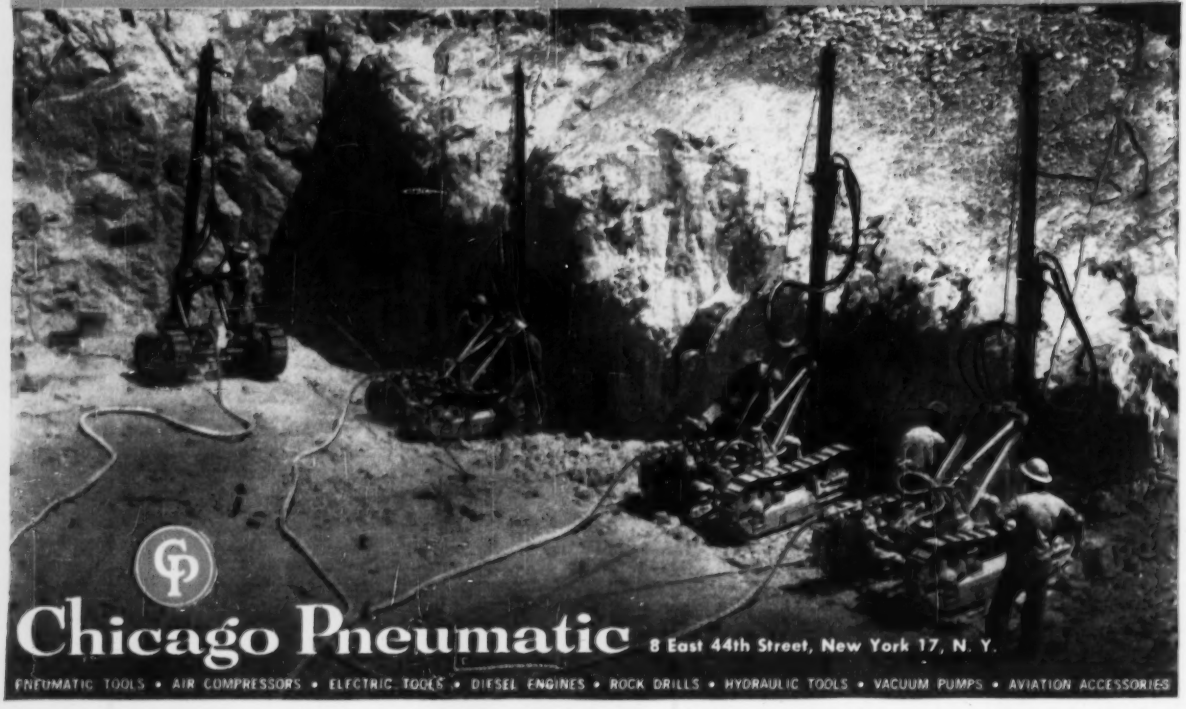

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Reader Comment

Engineer Salaries

SIR—I note in your Nov. 22 issue a piece on hiring foreign engineers. In my opinion the proper solution to the alleged shortage is better pay, not importing cheap foreign labor. A working engineer or designer cannot expect to earn more than $10,000 a year as long as he is actually doing engineering work.

To get more he can become a leg man for designers, i.e. a project engineer or a salesman or a paper-pusher of one sort or another. If he goes into private practice and wants to earn more than the $10,000 a year for himself after the cost of his capital then he must become a business administrator and hire his engineering.

Of course, many men with the title of "engineer" earn more than $10,000, and of those who earn more, some are paid more. However, seldom is a man found actually doing engineering design with such a salary, exclusive of overtime.

In view of the economic position of other professions compared to this one, I can only conclude that the so-called shortage is actually a shortage of cheap help. How else explain the fact that engineers, allegedly on short supply, still do clerical work, write letters in longhand, do their own filing and their own routine drafting. How else explain the fact that the use of "technicians" is still news in this line of endeavor.

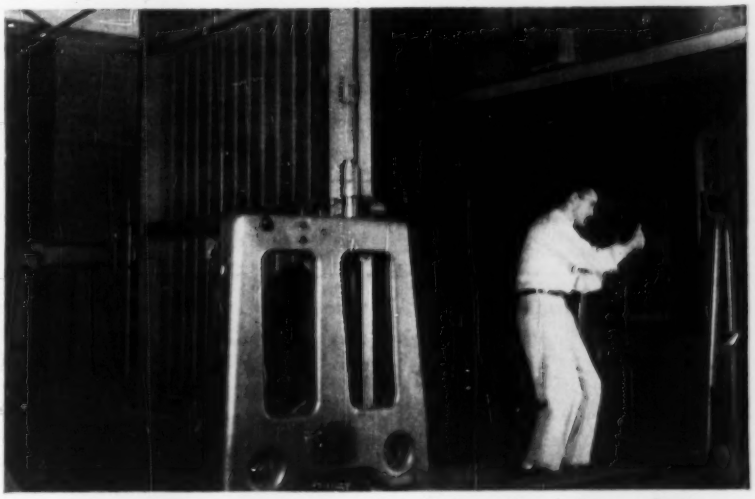
I repeat, the only answer is to raise pay and thus at the same time attract more to the field—more good ones that is, to earn the higher pay and also provide a real incentive to use technicians to enable employers to use their valuable engineers to best advantage. This incentive will not appear until the valuable engineers also become expensive.

JOHN G. KNEELING
Engineering Consultant
Staten Island, N. Y.

SIR—I frequently contemplated the starting salaries of the young engineers—also the salaries of the older men and the question, "Where will the boom take us?"

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

DRAFTING TRENDS



A good cameraman is one key to making high quality cloth reproductions.

Cloth reproductions safeguard originals, save drafting time

Many priceless original drawings are subjected to constant punishment. Corners become dog-eared (from filing and handling) and base stock is abused through repeated erasures when elements must be redrawn. In addition, drawings are prematurely aged and discolored as they go through a reproduction machine time after time.

An increasing number of plants are turning to reproductions on durable cloth stock to protect original drawings. The cloth repro is actually a "duplicate original." It can be repeatedly erased, corrected, intensified, redrawn, used for further printmaking. Negatives can be assembled with sections from other drawings. Expensive original drawings can thus be permanently and safely stored.

How photography improves worn original drawings

Since one method of producing a cloth reproduction is via photography, good camera work improves original drawings in several ways. Weak, fuzzy lines are intensified. Differences in strength of lines are often equalized. Faded or weak areas can be strengthened.

Even *after* an original drawing has been photographed, it can still be improved. A good retoucher can bring back parts of the original drawing. Background smudges or tape marks can be blocked out to give good, clear, clean prints.

By using photographic techniques, cloth repros can be *better than the original.*

Cloth repros simplify enlarging, reducing

Photographic enlargement or reduction to scale eliminates much routine work. By turning details over to the camera and an experienced staff, draftsmen are released for more important layout and design work. Often in a matter of one or two days, you can have a drawing enlarged or reduced to the desired size on a cloth base *without losing valuable drafting time.*

More information on cloth reproductions and a sample print are available from the Reader Service Division of the Frederick Post Company, 3650 N. Avondale, Chicago 18, Illinois.

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Severe weathering had deteriorated sections of cornices, sills, lintels and ledges. Cracks permitted water penetration, causing damage to interior of building.

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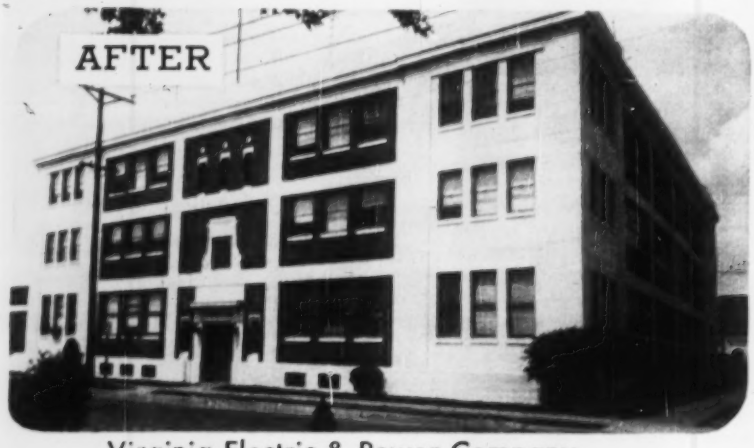
Brick was left uncoated to develop pleasing contrast. See Circulars No. 16 and 20.



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. . . Reader Comment

It happens that I have been depending on civil engineering as a profession for a living since 1906 after completing a university course. At this time the young graduate would receive generally between $50 and $100 a month. Room and board for a single person in a good locality was available at between $20 and $30 per month. For a married man, a good single house could be had for $15 to $25 per month. Food for two would cost around $5 a week. After all necessary costs, there would be a balance of $20 to $30 per month. Young engineers nearly always saved money. Their university education had cost them from $1,000 to $2,000 and generally four years of time.

Business was slow between 1906 and 1914, the period before the beginning of the First World War. During the First World War, employment was better and the young engineer could get a salary between $2,000 and $3,000 per year. There was a living employment for all. The national debt at the end of the war was small and refunded quickly.

The period between 1919 and 1929 appears today to have been the best 10 years in the last 50. It was at the beginning of this period that the writer became an employer of engineers, draftsmen, and assistants in a consulting business. It is interesting and instructive to compare the young engineer of five years' experience in this period and the same man at the present time.

Such comparison shows that the salaries for today's young engineers must exceed $6,000 per year before any real saving can be made, and the savings after they are made will, unless some changes are brought about in our fiat currency to curb the present wave of inflation, be rendered worthless.

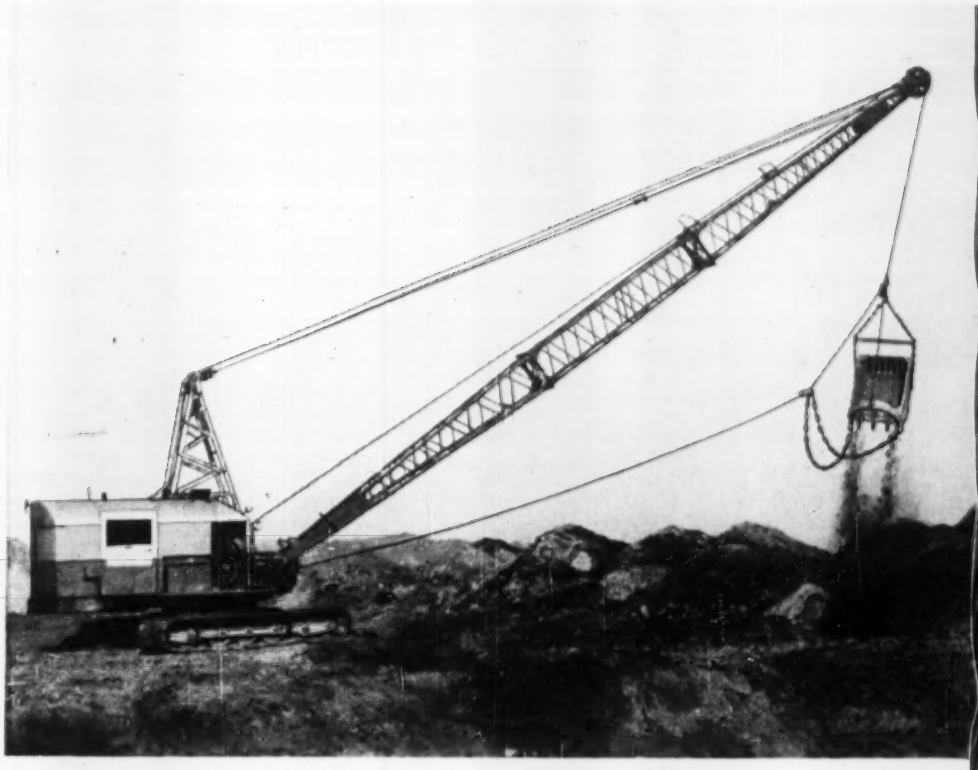
The boom has now progressed to such an extent that capital goods are generally priced at from 2 to 4 times the cost 30 years ago. These items are still increasing in cost.

We are now on the 100th anniversary of one of the greatest disasters that ever befell the nation. This was caused by an inflation developed along the same lines that we have seen this boom grow during the last 25 years.

G. L. Bilderbeck
Consulting Engineer
Groton, Conn.

Source of Housing Statistics

Sir—In the story, "Housing Census Depicts Current Trend", (ENR, Nov. 29, 1956, p 24) which presents the results of our surveys of characteristics of new housing in the first quarters of 1954, 1955 and 1956, I fear that the public may be confused by the use of



New VHS Dragline Lasts 58% Longer ...at Keller Mines

Mr. John Oreskovich, Superintendent of Keller Mines, Inc., Beloit, Ohio says: "9 to 12 days used to be about all the life we could expect from the best Improved Plow Steel draglines on this Lima 1201 excavator. However with new VHS we are getting from 19 to 24 days—increasing service life from 58% to over 100%. Naturally we have switched to VHS on every piece of equipment for which a VHS line is made."

Service records like this are becoming commonplace in the mining industry. For new tougher VHS resists abrasion . . . keeps its shape under pressure . . . can't become "hide bound" or lose its flexibility. Developed specifically for draglines, slusher ropes and shovel hoist ropes, it stands up better in these toughest of wire rope applications.

Cuts "Down Time," Saves Money—The longer life you get from new VHS saves you money. And you make additional savings by cutting costly "down time" of equipment for wire rope replacement.

Stronger Too—New VHS, made from a new grade of steel for wire rope, is at least 15% stronger than Improved Plow Steel—the strongest grade available before the introduction of VHS. This means you can handle heavier loads with the same diameter line. And you have a higher factor of safety . . . additional insurance against sudden overstresses.

Easy to Order—You don't need any complicated specifications to order new VHS. Just call your Hazard distributor and ask him for a VHS dragline, shovel hoist rope or slusher rope in the size you want. He has it in stock.

For more information see your Hazard distributor salesman or write to the nearest Hazard office for Bulletin DH-513H

HAZARD WIRE ROPE DIVISION
American Chain & Cable Company, Inc.
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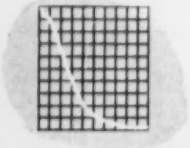
Only Rotovalves give you all these features:

LEAST PRESSURE LOSS
Full line opening means less head loss, lower pumping costs.

EASIEST TO OPERATE
Hydraulic imbalance and mechanical design mean 1 man can close as fast as required. Less power needed in mechanical or electrical operation.



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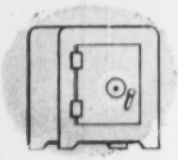
Rotovalve 55% closed at 25% stroke, and 92% closed at 50% stroke. In comparison, gate valves only 18% closed at 25% stroke and 43% closed at 50% stroke.

MOST CONTROLLED CLOSING TIME
Closing as quickly as one second or as slow as needed. Fast initial closing limits reversal of flow.



MOST POSITIVE CLOSING
Drop-tight, positive closing. Self-purging, monel-to-monel seating. Pressure-tight bolted head, stuffing box, and machined and lapped seats.

In addition to all these features typical of SMS engineering, Rotovalves have a flexibility that makes them suitable for any type of operation, any method of control, or any sort of location.

For detailed information about SMS Rotovalves, Ball or Butterfly Valves, see our local representative or write to the S. Morgan Smith Company, York, Pennsylvania.

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. . . Reader Comment

the words "Housing Census" in the title and the description of the study. Your staff apparently was confused in describing the source of the data.

The statement that the figures were developed by a Bureau of Census Survey in the first quarter of 1956 for the Bureau of Labor Statistics is incorrect. The Bureau of the Census had no part in collecting or compiling the data. The surveys were made solely by the Bureau of Labor Statistics.

The 1954 and 1955 data shown in your table were collected by the Bureau of Labor Statistics entirely with its own appropriated funds. A few private firms did contribute to the surveys for those years to obtain special information which is not shown in your table.

Financial support for the 1956 survey came from the National Association of Home Builders and some other sources as well as from the Producers' Council, though the latter was the major source of outside funds. As in previous years, the outside funds for the 1956 survey were used primarily to obtain detailed characteristics of new houses, many of which are not shown in your table.

EWAN CLAGUE
Commissioner of Labor Statistics
Washington, D. C.

CALENDAR

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 7-11.

Seventh Annual Sanitary Engineering Conference, University of Kansas, Lawrence, Kan., Jan. 8.

Society of Plastics Engineers, Inc., 13th Annual National Technical Conference, Hotel Sheraton-Jefferson, St. Louis, Mo., Jan. 16-18.

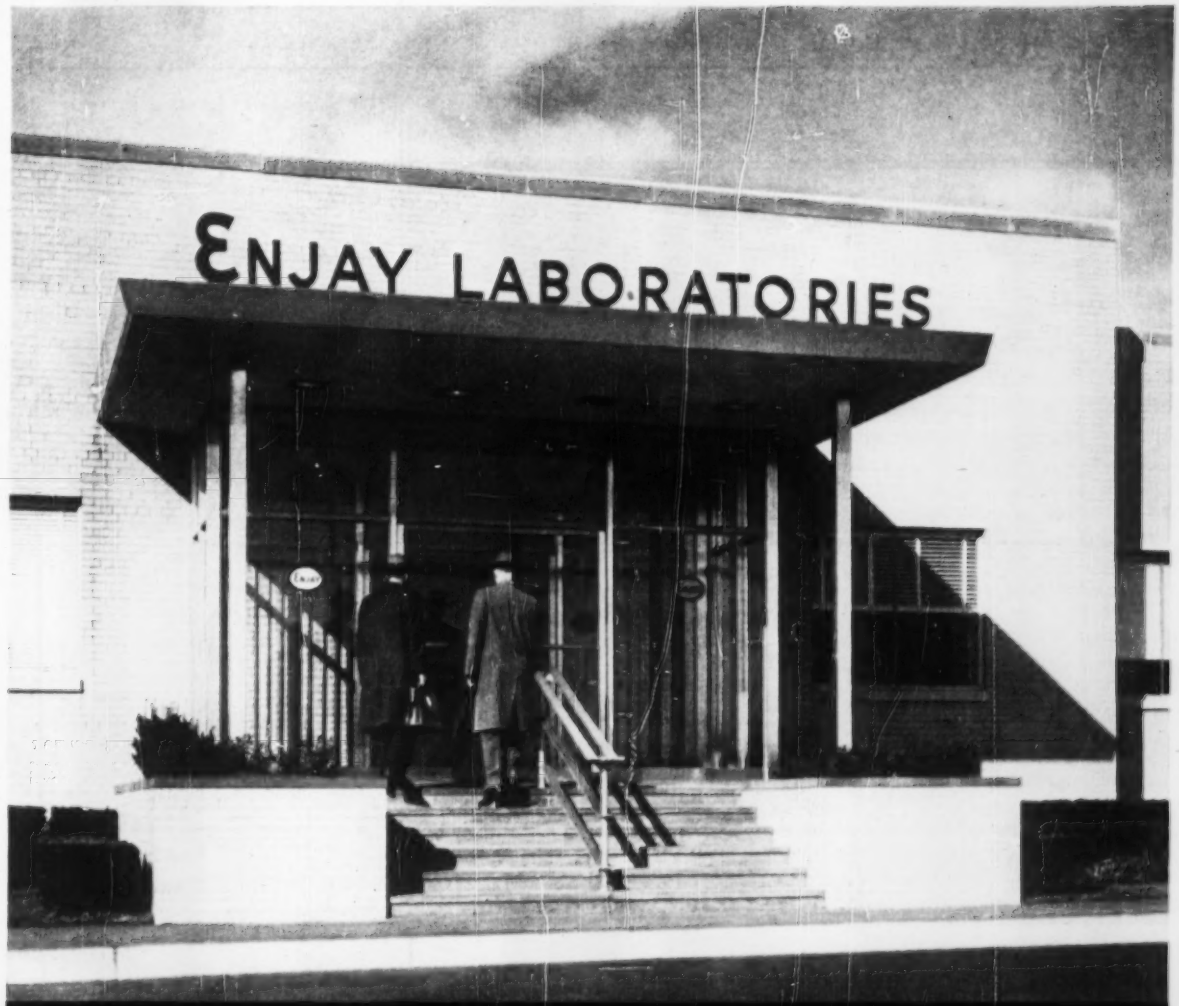
Engineers Joint Council, Third Annual Assembly, Jan. 17-18, with Assembly Dinner evening of 17th. Reservations: EJC, 29 W. 39 St., N.Y.C. Place: Hotel Statler, N.Y.C.

National Association of Home Builders, annual convention and exposition, Hotel Sherman, Hotel Conrad Hilton and Coliseum, Chicago, Ill., Jan. 20-24.

Associated Equipment Distributors, 38th annual meeting, Conrad Hilton Hotel, Chicago, Jan. 27-30.

American Road Builders Association, annual meeting and road show, Chicago Amphitheater, Jan. 28-Feb. 2.

Reinforced Plastics Div., Society of the Plastics Industry, Inc., 12th Annual Technical and Management Conference, Edgewater Beach Hotel, Chicago, Ill., Feb. 5-7.



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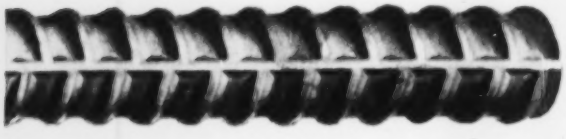

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THE CONSTRUCTION WEEK

BUDGET PREVIEW—With the federal budget for fiscal 1958 still a well-kept secret, ENR learned last week that the Corps of Engineers has asked the Budget Bureau to seek approval of a $16-million appropriation for the 35-ft depth Delaware River dredging project. Because of heavy defense expenditures next year, the Budget Bureau has asked Army Engineers to trim their request for funds for this channel deepening project, according to an ENR source. The President's budget message will go to Congress next month.

MORE STEEL AT A PRICE—The steel industry plans to spend $1.659 billion in 1957 on new plant and equipment, according to the survey of the McGraw-Hill Department of Economics. This is good news but it poses a special problem for the construction industry—plant expansion will use up some of the structural steel counted on for other types of facilities. The balancing hope is that some of the new steel capacity will be in structural shapes and plate. Bethlehem Steel has said it is ready to go ahead with as much as a million tons of this kind of expansion if it can obtain fast tax amortization.

NO CRIMINAL NEGLIGENCE—A second investigation into the collapse on Oct. 3 of the Consumers Power Co. building under construction near Jackson, Mich. (ENR Oct. 11, p. 24) has led to the conclusion that there is no "direct evidence of criminal negligence." The report was issued by Jackson County prosecutor, Kenneth B. Johnson, who said his office had investigated such complaints as insufficient curing of concrete, inadequate re-shoring, improper tying of bars into columns, insufficient mixing time and too early stripping of forms. Interest now awaits a report of a governor's investigation commission.

EXPENSIVE MOUNTAINS—The Bureau of Reclamation has put the brakes on awarding of contracts for construction of Clear Creek Tunnel—a phase of California's Trinity River Project. The reason: Mountainous and nearly inaccessible terrain around the project has shoved bids way over estimate.

The low bid—submitted by the joint venture of Shea Co., Henry Kaiser, Morrison-Knudsen, Macco Corp. and Raymond Concrete Pile—was $36,644,556. The bureau's estimate was $25,549,569.

CUTTING DOWN SMOG—A device to cut down on automobile-generated nitrogen oxides—one of the elements considered responsible for smog formation—uses the familiar carburetor water-injection principle. The device—developed by UCLA Professor Richard D. Kopa and a team of student researchers—shoots a fog mist that reduces the combustion heat at the peak temperature—the period when most of the oxides of nitrogen are formed.

14.8 MILLION YARDS TO MOVE, 56 BRIDGES TO BUILD,

IN 29.6 MILE DALLAS-FORT WORTH "SIX-CHUTER"!

Unlike most other turnpikes, the 6-lane Lone Star Speedway is being cut, filled, borrowed and spanned along a populated route, crisscrossed, by many heavily travelled roads. To add to contractors' headaches, up to 300,000 gallons of water a day have to be trucked in for compacting. Note how self-propelled scrapers are *tandemed* to tackle the sun-hardened soil. Tires are Goodyear's wide-base Hard Rock Lugs—now standard on much original equipment.

Tire maintenance in field helps construction men beat tight work schedule.

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WASHINGTON OBSERVER

California has its license from FPC to build the $420-million Oroville Dam and auxiliary dams on the Feather River in northern California. Project will store water for transmittal to the southern California area behind a dam that will be higher than the Hoover Dam, bigger than Grand Coulee (ENR Mar. 10, 1955, p. 21).

FPC has wound up its hearings on Pleasant Valley-Mountain Sheep dams on the Snake River applied for by the Pacific Northwest Power Co. (ENR Dec. 20, p. 19). These projects would cost an estimated $234-million, including transmission lines.

Both sides now have chances to sum up their position, and the examiner's decision should come sometime next summer. Big hitch that could upset all this is the pressure on Interior Secretary Fred Seaton to intervene in favor of a high dam at the Pleasant Valley site.

•

Inexpensive sewage treatment methods for small cities are getting special attention from Public Health Service research engineers. Studies that have been conducted in both North and South Dakota disclose that the lagoon method may cost only two-thirds as much as conventional plants providing the same degree of treatment.

Investigations are now underway in two spots to find even cheaper and better designs, under the control of engineers from PHS Robert A. Taft Engineering Center in Cincinnati. Cost data for several lagoons studied show they average $14.84 per capita per year. There are now 136 such installations throughout the Missouri River Basin.

•

Federal officials still haven't decided how to fix flood insurance rates under the law passed by the last Congress. The problem is whether to charge a flat rate for all classes of risks—or charge more for those whose plants and homes are in locations that are more frequently flooded.

A uniform rate means that those in safer locations would be penalized unduly if the insurance pool were to operate without excessive government subsidizes and still remain within reason. If rates are scaled there probably wouldn't be sufficient money in the pool without big outlays by the federal government. Limit on insurance is $250,000 for any one firm or person; this obviously isn't sufficient to take care of the needs of large industrial or commercial establishments.

•

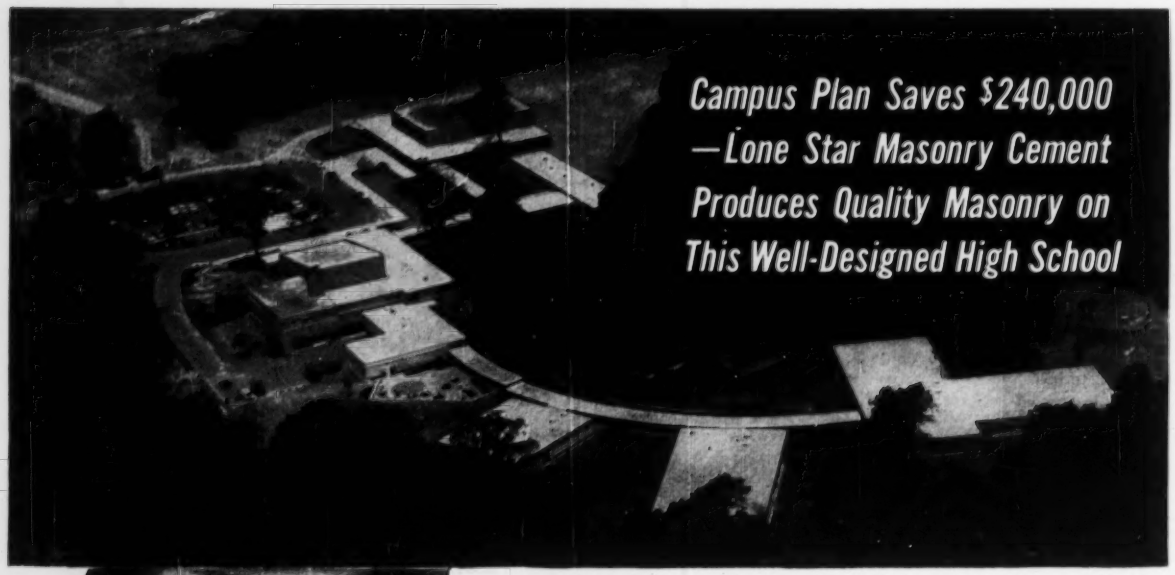
Kentucky officials are already talking about bailing out their turnpike by getting the federal government to pay off the bonds immediately and make the route a free road of the interstate highway system. Pennsylvania's Governor Leader, however, beat them to the punch some months ago with a similar proposal for his own famed pike.

Kentucky's 40-mile road runs from Louisville to Elizabethtown and has been taking in less than enough to pay off the interest on the bond issue—$38.5-million—during the four months of toll collections.

The turnpike is a part of the interstate network as now drawn; but there's no immediate hope in sight for Kentucky officials or for other states that might want to convert their turnpikes into free roads.

Congress told the Bureau of Public Roads to report by 1958 on the problem of reimbursing states for the depreciated value of tollroads that meet interstate standards if they are taken over as part of the system under the new highway law.

More School-Less Cost



Campus Plan Saves $240,000 —Lone Star Masonry Cement Produces Quality Masonry on This Well-Designed High School

● Campus or unit type plan provided better school facilities, at a $240,000 saving, through minimum rock excavation . . . placing units on level land, with ramps and covered passageways compensating for differences in elevation . . . eliminating expensive corridor space.

Quality construction matches ingenuity in design. Lone Star Portland Cement was used in the structure . . . cinder block made with 'Incor' 24-Hour Cement, as well as all other masonry, was laid up with Lone Star Masonry Cement, for quality with economy:

SAVES TIME AT MIXING BOX: No lime or portland cement to add, no soaking or slaking. One ready-to-use cementing material means one less variable in proportioning.

SAVES TIME ON SCAFFOLD: Extra fat mortar spreads easily, doesn't gum up trowel, easier to tool, makes neater job, with strong, permanent bond.

ASSURES WEATHER-RESISTANT WALLS: No added water-proofing material needed; inherent water repellency and low absorption protect against weather action. Chemical soundness safeguards against delayed expansion of joints, saves repointing.

NON-EFFLORESCENT: Lone Star Masonry Cement is practically free from salts; low absorption and high water repellency restrain leaching out of salts in water, sand or brick.

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Wide World Photo

RIGHT-OF-WAY

The greater part of the new interstate highway system will be built on new location, and all of it must have controlled access. The question of acquiring the needed land poses a . . .

Legal Challenge on the Roads

Eugene E. Halmos, Jr.
Senior Editor

The nation's courts and lawyers will have at least as much to say about progress of the multi-billion highway program as will the engineers, administrators and contractors.

That much is clear enough after a study of state laws governing the most-discussed roadblock to the program—the question of right-of-way acquisition and the related problem of limited access.

In both concept and detail, state laws vary greatly enough to insure a long and busy period of analysis as to the exact meaning of existing laws and as to what new legislation or amendments are needed.

It has been estimated that nearly two-thirds of the 41,000 miles of roads, which will form the interstate system, will be built on new location. To obtain the needed land, highway planners will have to work within the framework of the various state laws. And the fear has often been expressed that these laws are generally inadequate for the job that must be done.

A survey by ENGINEERING NEWS-RECORD, covering all 48 states, the District of Columbia and Puerto Rico, doesn't bear out that fear completely. It shows a variegated picture—one with potential trouble spots but with an overall effect that isn't nearly as bad as might be expected.

On the plus side, these facts stand out:

- A majority of states—33 and Puerto Rico—already have in their statutes limited-access laws they consider to be adequate.
- Twenty states already are armed with so-called "quick-take" laws that permit immediate entry on lands needed for highway purposes without waiting for completion of condemnation or other court action. Many of the remainder can gain entry at least on completion of condemnation proceedings that are specifically speeded up by law.
- Sixteen states have the specific right to acquire land for use in the future.
- Ten states are empowered to obtain by condemnation or other means not only all lands needed for the right-of-way but certain other adjoining lands.

On the minus side:

- Only two of the states now have revolving funds that enable them to purchase land well in advance of construction, thus freezing out further development that might advance land prices and hamper later road development. Two others have bond-financed funds that can be used in part for this purpose.
- Twenty-eight face delays ranging from 10 days to several years in taking land even in the face of condemnation proceedings because of special legal provisions.
- Three states may obtain only easements—not actual title to lands under their roads.
- Five depend heavily on local government units to obtain right-of-way for them.
- And 23 state highway agencies consider new legislation necessary to clear the way for the roadbuilding program.

- **Take it quick**—Probably the most-envied right-of-way officers are those in states that can obtain immediate entry to lands required for highway purposes without regard to court actions that may develop.

One example is Maine, where the state takes immediate title as soon as it has decided it needs any tract, completes a survey and description and files with the local county register of deeds this information plus a plan of the proposed improvement. The decision of the State Highway Commission as to the need is considered final. A property owner may, of course, take action if not satisfied with the amount of an award made to him—but such action does not

bar the state and its contractors from taking possession of the land.

New York, Massachusetts, Pennsylvania and West Virginia, have similar laws. Nebraska and Utah provide that cities must develop master plans—and with such a master plan, the state can obtain a "certificate of taking" signed by the governor which gives immediate access.

One state—New Jersey—actually can enter lands without even filing plans or condemnation action—and the procedure has been used occasionally on vacant lands. It is never used, however, on occupied tracts.

• Take it slow—In most states, however, some delays for legalities are the rule. Usually, these rest on requirements that the land may not be entered until condemnation proceedings are filed, hearings have been held and an award made. In most cases, once awards have been made—most often by a court-appointed board of appraisers—the state may file a check for the amount awarded with the court or other agency and then enter for construction purposes.

The delay involved here varies considerably. Missouri, for instance, has statutes that provide that action on condemnation and an award may be made within 10 days of filing, and that the state may enter on depositing the award. More typical is Oklahoma, where the state must give 10 days notice of its intent to condemn and, after appraisers have made an award, pay the money to the court and gain entry to the land 30 days later.

At the other extreme are states like New Hampshire where acquisition must start with a petition by the highway department to the governor seeking permission to "alter" a specific section of road. On the governor's approval, hearings must be held, awards determined and money paid over—after which the state can enter.

In Washington, Idaho and Illinois—because of State Supreme Court decisions—the state may not enter condemned land until all proceedings have been completed, and a final determination of damages made. Vermont has an added problem: Its laws permit an appeal to the courts on the grounds of the necessity of the new road—as well as on the question of damages resulting from its construction. And, when an appeal is taken on the question of necessity, the state may not take possession until that appeal has been heard by the courts—a process that may take several years.

North Carolina doesn't have the right to condemn land for highway purposes; it can acquire right-of-way only by negotiation.

And five states—Alabama, Kentucky, Texas, Tennessee and Wyoming—have a very special problem. In those states, land for state highways is acquired for the state by local governmental units, and any necessary condemnation actions must be prosecuted by these local units. In all five, steps are now being taken to, at least, offer aid to the cities and counties in this matter.

Another problem for the "slow-take" states is fairly common—delay in getting court action. Mississippi, for example, may take land on payment of damages awarded by courts or specially-appointed boards. But in rural areas, county courts meet only at specified intervals, in addition, an appeal from such a court award requires an entirely new trial—with further delay.

• Take it for later—The question of acquisition of land for future highway use is a hotly-debated one, even in the 16 states that have specific authority to take such action.

Most of the argument revolves around the court-supported contention that in order to assess damages to the property owner properly, the court must have before it an adequate set of plans showing what the state intends to do with the property. This contention then immediately runs into two other problems facing the highway departments—the engineering manpower to produce such plans and the money to pay for lands that won't be used for some time to come.

In the states where future taking—beyond a few months ahead of plans to let contracts—is permitted, the highway departments must have available at least general drawings and maps showing locations of the proposed roads and types and locations of structures. De-

How the States Stand on Right-of-Way

	Quick Take	Legal Delays in Taking	Take more than needed	Future Acquisition	Limited Access	Revolving Fund	Seek new Laws
Alabama							
Arizona				✓			
Arkansas		✓					
California	✓			✓	✓		
Colorado		✓			✓		
Connecticut	✓				✓		
Delaware	✓				✓		✓
Florida		✓			✓		✓
Georgia		✓	✓	✓	✓		✓
Idaho		✓			✓		✓
Illinois		✓			✓		✓
Indiana		✓		✓	✓		✓
Iowa		✓			✓		
Kansas				✓			✓
Kentucky		✓			✓		
Louisiana	✓			✓	✓		
Maine	✓				✓		
Maryland	✓			✓	✓	✓	
Massachusetts	✓			✓	✓		
Michigan		✓					
Minnesota		✓			✓	✓	
Mississippi		✓			✓		
Missouri	✓		✓	✓	✓		
Montana		✓					✓
Nebraska	✓		✓	✓	✓		
Nevada							
New Hampshire		✓			✓		
New Jersey	✓		✓		✓		✓
New Mexico	✓	✓			✓		✓
New York	✓		✓	✓	✓	✓	
North Carolina		✓					✓
North Dakota		✓		✓	✓		
Ohio		✓			✓		✓
Oklahoma	✓						✓
Oregon	✓		✓		✓		
Pennsylvania	✓		✓		✓		
Rhode Island	✓				✓		
South Carolina	✓						
South Dakota		✓					✓
Tennessee		✓					✓
Texas		✓					✓
Utah		✓		✓	✓		✓
Vermont		✓			✓		✓
Virginia					✓		
Washington		✓			✓		✓
West Virginia	✓				✓		✓
Wisconsin	✓		*	✓	✓		✓
Wyoming		✓					
D.C.		✓		✓	✓		
Puerto Rico	✓			✓	✓		

Maryland—Bond fund. Missouri—Possession after 10 days.
Minnesota—Bond fund. N. Carolina—No condemnation authority.

tailed contract drawings are not required, however.

A number of other highway departments reported to ENR that they are not prohibited from acquiring right-of-way for future use, but cannot hope to be able to produce the advance plans that would be required.

And there's another nice legal question to be settled in nearly every state: Most state laws that permit acquisition for future use contain the phrase "for a reasonable period." Just what constitutes a "reasonable period" probably will have to be adjudicated.

• **Money found**—Not surprisingly, none of the highway departments seems worried about funds for land acquistion: The fact that federal payments can go in part for this purpose is the answer.

Best off, however, with regard to money, are New York and California—both of which have revolving funds available to the highway agencies for use in acquiring land—much of it for future use. New York's fund of $20 million was established a little over a year ago. California's fund—now $30 million—was first established in 1952.

California's experience is a mouth-watering one for many states: The Highway Department borrows from the fund for purchase of right-of-way, repays without interest when the land so purchased is actually put to highway use. As of September, a total of $20.3 million had been spent for this purpose, about $2.5 million repaid. But most importantly, the roads bureau estimates that savings to the state through this process now amount to about $134 million—the difference between the price the state paid and the price the land now would bring.

Maryland, by virtue of a $564-million bond issue it voted three years ago to finance a general 12-year highway improvement program, has ample funds available and special powers to meet acquisition needs. Wisconsin also has a $150-million bond issue at its command for this purpose.

Some other states, like Georgia, have taken advantage of the Federal Highway Act's provisions to solve their money problems. A new state law sets up state matching funds in advance for each road project—money on which the Highway Department can draw for land costs and repay out of its matching fund money when that is paid over. Indiana is planning to do the same thing and so are many other states.

• **Access control**—Thirty-three states and Puerto Rico already have enacted controlled access laws—some of them dating to the early 1940s. These laws vary to some degree. But in general they give the state the right to control entry to the highway itself, and in many cases also grant the specific right to control use of lands adjoining the right-of-way.

Most trouble in this regard has so far appeared in sparsely populated, largely rural areas where the real meaning of limited-access only now is becoming clear to local residents.

Idaho is an example. Its access laws—in the opinion of many observers—don't contain adequate provisions for enforcement and penalties. The state is forced to seek an injunction against recalcitrant property owners who insist on entering a limited-access facility. The process is slow and unsatisfactory and also opens the state to suits for damages because of changes in road alignment, grades and dividers that an owner may claim interfere with his access.

• **New laws needed**—In their efforts to bring the laws under which they operate into line with requirements of the new highway program, a total of 23 highway agencies are planning to ask for new legislation this year.

These requests fall into several general categories—and a number of special ones.

Biggest category will certainly be legislation permitting "quick-take"—or at least quicker taking of land than is now possible in many places. A second will call for legislation to permit the states to take more than the land actually required for the road right-of-way. This may be specifically prohibited in many states now, but it is a source of constant trouble and sometimes expense to the highway department.

Another group of requests will concern money—mostly requests for some sort of a revolving fund and with it amendments to permit acquisition of right-of-way for future use.

But there will be many special cases. Arizona, for instance, will seek the right to "freeze" a piece of land it wishes to take to prevent a property owner from thereupon increasing its value by hastily building improvements for which he would have to be paid. Indiana wants its law amended to permit taking full title—rather than an easement—to right-of-way. Michigan wants the right to condemn land for exchange with public utilities for relocation of facilities. Nevada—where limited-access must be approved by cities and counties—wants its law changed in that respect. West Virginia wants the right to obtain easements for scenic areas as well as right-of-way.

Not all of the remaining 25 state highway departments are completely satisfied with their laws—some would like to see further changes made. But many considerations, and these include most prominently political considerations, lead many of them to leave well enough alone for the present—the existing laws are considered at least workable.

Better legislation—like more general public acceptance—is a function of public relations as these administrators see it. The legislators also must be convinced of the value of the highway program before they will easily accede to more stringent regulation of property owners who are also voters.

As drought still plagues the Mississippi . . .

Court Lifts Lake Diversion

The Supreme Court of the United States last week approved temporary increased diversion of Lake Michigan water into the Illinois River, as a way to boost navigation depths downstream in the still-low Mississippi River around St. Louis.

From now until Jan. 31, the diversion may be increased from 1,500 cfs to 8,500 cfs. The increase is expected to afford an extra foot if navigable depth in the Mississippi's Lock and Dam 26 at Alton, Ill.; it is expected to lower the level of Lake Michigan by a scant quarter of an inch.

The rate of 1,500 cfs is the legal diversion limit for water taken from the lake through the Chicago Sanitary and Ship Canal—a limit set by the Supreme Court in 1930. Illinois petitioned the court for the temporary increase now granted. Wisconsin opposed the application on grounds that the level of the Great Lakes would be affected, claiming that this level already had dropped over the last few years. New York and Michigan also opposed the increase. There was no comment from Canada on the ruling.

• **Army Engineers study effect**—The Corps of Engineers already had two special studies under way on effects of increased diversion from the Great Lakes through the Chicago Sanitary and Ship Canal when Illinois asked the Supreme Court for an increase to 10,000 cfs for 100 days, exclusive of domestic pumpage that runs some 1,800 to 2,000 cfs. A third study was quickly made.

At 10,000 cfs for 100 days, the Engineers estimated that the temporary maximum lowering of Lake Michigan would be in the order of ½ in. At 8,500 cfs for 45 days, granted by the court, the effect would be "very minor," with maximum lowering of Lake Michigan of maybe ¼ in. This, of course, is a guess, as no specific study has been

made of the court-established 8,500-cfs rate.

Diversion at 8,500 cfs would raise the Mississippi River level about 1 ft over the lock sill at Lock and Dam 26, Alton, Ill., where the chief trouble has occurred. This increase would reduce the amount of barge lightening and reloading that has been necessary at Alton, where the depth has been only 7 ft over the sill as compared with the authorized 9 ft.

As soon as Brig. Gen. Paul D. Berrigan, Division Engineer, Corps of Engineers, Chicago, was notified of the permissible emergency diversion, he ordered the diversion of Lake Michigan water into the Chicago Sanitary and Ship Canal be increased to 6,000 cfs plus domestic pumpage which has been averaging from 1,600 cfs, to 1,900 cfs. This was accomplished by opening the locks at Lockport, Ill. and at the mouth of the Chicago River.

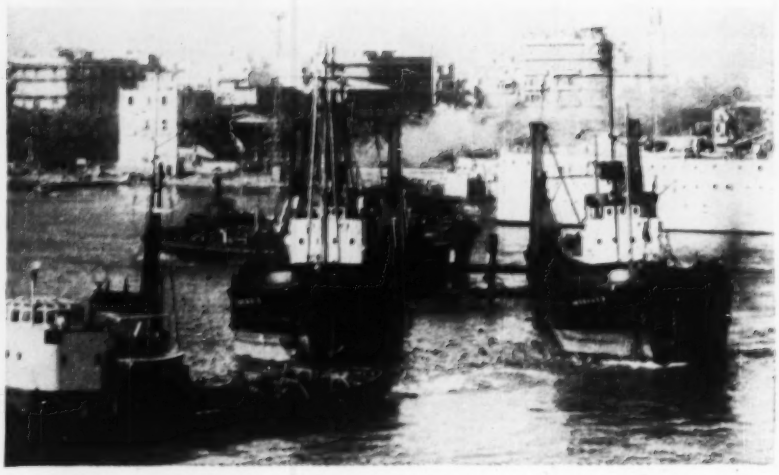
However, whether the total allowed diversion of 8,500 cfs is reached will depend on its effect on navigation. By Wednesday of this week, the total diversion was increased to 7,500 cfs, plus domestic pumpage, with a possibility of further increases if they do not adversely affect navigation.

From a navigation standpoint, increased flow could create currents in a narrow stretch of the Chicago Sanitary and Ship Canal just above Lockport that would be hazardous for shipping. Towboat operators don't want to see these currents get above about 5 mph, which is their normal upbound speed. Another critical reach is the Desplaines River through Joliet into which the Chicago Sanitary and Ship Canal empties.

• **Two other studies under way**—Special studies by the Corps on lake levels will be completed as scheduled—a short one for the President's office early next year and a longer one for Congress later.

In vetoing a bill during the last session that would have permitted additional diversion of 1,000 cfs for three years to allow study of sanitary effects by Chicago and the U.S. Public Health Service, Eisenhower referred to the bigger study the Engineers had been making since 1952. Later, the White House asked the Corps for a special report on the 1,000 cfs proposal. This report, soon to go to the executive office, will be a strictly factual engineering survey of the effect on lake levels, power and navigation.

The comprehensive study requested by 1952 Congressional resolution is a broad investigation of possibilities for regulating water levels in the Great Lakes to reduce the range of fluctuation: Hold down the highs and raise the lows.



POWERFUL GERMAN SALVAGE SHIPS shown lifting a sunken vessel from Port Said harbor two weeks ago. They are the Energie and the Ausdauer, under charter to the British Admiralty, but now released to the U. N. and working on clearance operations farther south in the canal.

U. N. Takes Over at Suez

With the departure of the last British and French troops from Port Said at the north end of the Suez Canal this week, the United Nations salvage forces have taken over the canal clearance job in its entirety. Directed by former U.S. Chief of Engineers, Lieut. Gen. Raymond A. Wheeler, these forces will have available a fleet of salvage vessels capable of making short work of clearing, at least a freeway, for the full length of the canal.

While the bickering over troop removal has been going on, the U.N. has been assembling tugs, floating cranes and auxiliary vessels owned by Dutch, Danish, German, Italian and other European firms. And most promising and helpful has been the clearance work already done by salvage ships that are owned or chartered by the British Admiralty.

Also it is quite likely that as much of this fleet and its crews as can be used effectively will remain as a part of the U.N. setup. It is believed that statements to the contrary by Egyptian President Nasser and U.N. Secretary General Hammerskjold were made largely for political reasons. Once the British crews are in civilian clothes, they will not be distinguishable from Danes or Germans, while the vessels themselves will be operating under charter just as is the case with all the so-called neutral vessels.

In support of this belief, it was announced that the ten British Navy vessels were pulled to one side of the outer harbor at Port Said as the last troops left so that they would be out of rifle range from the shore until local tempers calmed down. Included was an LST, used as a headquarters ship, an oiler, two water ships, a food supply ship and a tug.

The other salvage vessels, mostly on charter from private companies, were immediately released to the U.N., ready for service. Notable among the latter are two large German lifting vessels, the Energie and the Ausdauer, which have done yeoman service in Port Said clearance. They were dispatched south down the canal toward Ismailia to begin salvage work there.

What the eventual size of the U.N. salvage fleet will be has not yet been made clear.

Secretary General Hammerskjold, in his most recent statement, said that ten vessels were on hand ready to go to work immediately, an additional ten would arrive this week and that 11 more are due by the end of December. He also said that 600 crewmen, divers and salvage experts had been engaged. Whether this number included any of the 1,100 men in the British salvage fleet was not stated, although all had volunteered to stay after the troops left if they were wanted.

In any event the fact that General Wheeler moved from his temporary headquarters aboard a Danish ship at Port Said to his permanent land base at Ismailia on Dec. 26 is held to be an indication that most of the shadow boxing is over and that clearance operations in the untouched southern reaches of the canal will soon be getting under way in earnest.

Rio Grande Valley declared underground basin . . .

State Acts to Conserve Groundwater

A vast section of the Rio Grande has been declared an underground water basin in New Mexico by State Engineer Steve E. Reynolds in an action that, in effect, freezes water use at present levels.

Announced suddenly—though it has been planned for many months—Reynolds' action was taken under a 1931 law that already has been challenged successfully in district court (Chaves County) and still is awaiting final determination in the State Supreme Court.

Affected by Reynolds' declaration is an area some 280 miles long and 25-30 miles wide, between the Colorado line and Elephant Butte in southern New Mexico. Surface waters of the Rio Grande—long since fully appropriated and covered by the Rio Grande Compact—are not affected.

From the effective date of the declaration, all well-drilling in the basin comes under strict control of the state engineer. While small, domestic users won't be affected much—outside the red tape formality of getting permits—large water users (municipal and industrial) will have to buy up "water rights" to irrigated land and retire these water rights as a condition for future heavy withdrawals of underground water.

Creation of underground basins to control water use is a practice in several water-short southwestern states. Other states have created specific basins with specific laws. New Mexico's law is, perhaps, unique in that it vests full jurisdiction in the state engineer.

It was this factor—the state engineer's jurisdiction—that was successfully attacked in Chaves County district court. The court upheld a contention that the determination of quantity and extent of the right to use water is reserved to the courts. The state engineer appealed to the state Supreme Court which postponed hearings indefinitely.

• **To increase surface flow**—Creation of the Rio Grande underground basin actually is expected to increase the amount of water flowing into Elephant Butte, since the state engineer's action is based on the premise that surface and underground waters in the basin are interrelated—that underground withdrawals affect the stream's total supply.

Reynolds pointed out that the purpose of the basin is to protect surface water supplies through controlling underground water. He said a major change under the new plan probably will be different points of water diversion—substitution of a well at one point, as an example, for the taking of water from a ditch at another point.

What this means is that a large water-user who bought up the required number of water rights on irrigated land to qualify for drilling wells wouldn't have to drill those wells on the same land. He could retire the water rights by subdividing the water-right land into residential lots and drill his well elsewhere.

• **Credits are complicated**—Reynolds' declaration will have an immediate effect on the city of Albuquerque, which obtains all of its domestic water supply from underground wells. One question raised by the city hasn't been answered yet: What credit, if any, will the city receive for water it returns to the Rio Grande (via sewage disposal, etc.) below the city? One estimate of this return is 49% of the city's consumption.

Reynolds already has ruled that water rights to land acquired by the city for street rights-of-way and parks have expired and cannot be credited to future drilling by the city.

A long-range result in the Albuquerque area is expected to be increased industrial water use and a corresponding decline in use of the stream's flow for irrigation. Reynolds pointed out that 1,000 acre-ft of water will irrigate only 500 acres, but the same amount will provide for needs of 5,000 people.

Some rumblings of opposition already are stirring in Albuquerque.

Maurice Sanchez, chairman of the Albuquerque City Commission, sharply criticized the state engineer's action. He termed Reynolds' order the "most ill-advised and ill-conceived action possible until such time as state officials fully understood the relationship between surface and underground water rights and fully anticipate the possible impact of such an order on the state's economy." Sanchez also served notice bluntly that the city might ignore Reynolds' order.

58-Ft High Precast Bents Frame Church

High concrete bents—perhaps the highest ever precast—were hoisted into place in San Mateo, Calif., recently to form the frame for a church. The 58-ft high units weighing up to 40 tons were cast flat and erected by two cranes. Cracking was prevented by turning from horizontal to vertical position with the member off the ground. Legs of the 16-in. thick bents range from 16 to 32 in. width. Structure is for First Presbyterian Church of San Mateo. Architect is Donald Powers Smith and structural engineer is Isadore Thompson, both of San Francisco. General contractor was Trewitt & Shields of Fresno and erection was by Bigge Crane & Rigging Co. of Oakland.

A number of Albuquerque residents contend that Reynolds should have extended the basin all the way to the Texas line and that by failing to do so he sold the city's hopes "down the river." By chopping off the basin at Elephant Butte Dam, the dissenters claim, Reynolds has given the southern Rio Grande Valley (from Truth or Consequences to El Paso, Tex.) a big advantage. Why, they ask, should any large industry settle in Albuquerque where it must buy up water rights as a condition to well-drilling when it can go to southern New Mexico and drill wells without this expense and red tape?

$20 Million for Indian Steel

World Bank agrees to lend India additional funds for steel expansion; output will reach 4.5 million tons

The World Bank last week agreed to lend India $20 million to help finance a new round of steel expansion.

The loan was made to the Indian Iron and Steel Co., Ltd. (ISCO), a privately-owned company whose steel works are located at Burnpur, in West Bengal. With this financial aid, ISCO will build additional capacity and increase its output of semi-finished and finished steel to 800,000 tons annually.

ISCO is India's second largest steel producer, accounting for about one-third of India's present steel production.

The World Bank now has lent a total of $126.5 million to increase iron and steel production in India. This is the second loan to ISCO. The first loan of $31.5 million, was made in December 1952. The other steel loan, $75 million, was made to the Tata Iron and Steel Co., Ltd., in June of this year.

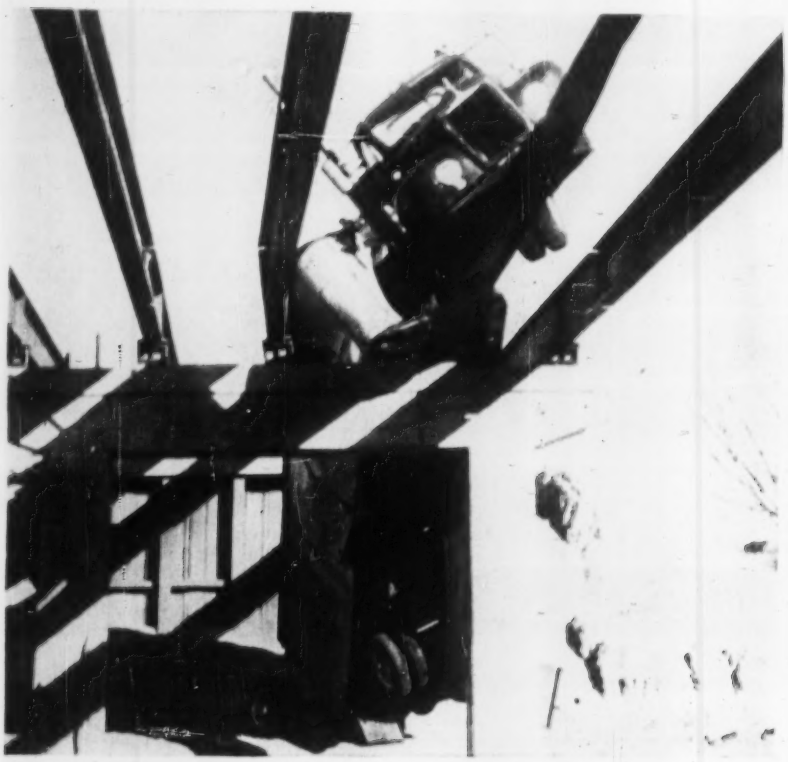
These loans help finance expansion programs that will enable the two private companies to produce 2.3 million tons of finished steel annually. In addition, the Indian government is building three plants that will have a total output of 2.2 million tons per year.

• **Add rolling capacity**—Last week's World Bank loan will help to finance additions to billet and structural mills and pay for construction of a new bar mill to increase rolling capacity at ISCO's Burnpur plant.

Also included in the project is addition of 20,000 kw of electric generating capacity. Total cost of the project is estimated at $31 million. The World Bank's loan will cover most of the foreign exchange costs. It is expected that purchases financed by the loan will be made in the United Kingdom, Germany and the United States.

• **Pay 5% interest**—The World Bank loan is for 11 years. It will bear interest at 5%, including the 1% commission charged by the World Bank. Loan amortization will begin April 15, 1960.

The loan is guaranteed by the government of India. It is secured by a first mortgage on ISCO's assets.



Look Ma! – No Bridge!

A 64,000-lb semi-trailer truck came to this end near Maywood, Neb., when the driver skirted road barricades leading to a detour, and continued on a partly-completed road. Unhurt, driver told highway police he thought he could avoid holes in old road, was unable to stop his vehicle before it skidded onto girders of uncompleted bridge.

Steel Official Dies

Crash of company plane claims life of A. G. Roach

Alden G. Roach, 55, president of the Columbia-Geneva Steel Division of U. S. Steel Corp. and two crew members were killed last week when a company plane crashed into a mountainside 90 miles northeast of Pittsburgh.

Mr. Roach was identified with the construction industry from his youth. He worked on railroad and bridge construction gangs while in his teens. In 1923, he received a civil engineering degree from the University of Illinois.

After acquiring engineering experience on projects for railroads and small steel plants, Mr. Roach joined Consolidated Steel Corp. of Los Angeles.

He rose rapidly in the firm. At 33, he was named vice president in charge of sales and engineering. He became president of the company when he was 40.

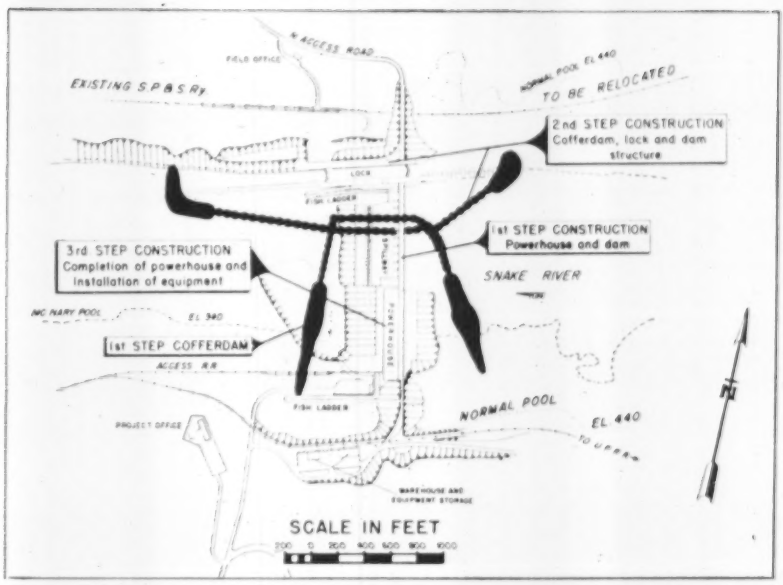
When Consolidated merged with Columbia Steel Corp., the West Coast subsidiary of U. S. Steel, Mr. Roach was chosen to head the operation.

Construction License Issued For Small Oregon Hydro Job

California Oregon Power Co. has been granted a license by the Oregon Hydroelectric Commission for construction of its $12.5-million Big Bend Project on the Klamath River (ENR Aug. 30, p. 25).

The project includes a 60-ft high earthfill dam, 11,000 ft of conduit, a 16-ft tunnel 16,000 ft long and a power plant containing two generating units, each with capacity of 40,000 kw.

Site of the dam will be 18 miles southwest of Klamath Falls, Ore. Plans call for powerhouse operation by Jan. 1, 1959.



Stage one of $135-million project attracts three bidders as engineers . . .

Open Bids on Ice Harbor Dam

There was a tremendous spread in the three bids received Dec. 18 for first-stage construction work on Ice Harbor Dam, on the lower Snake River in Washington. Low bid was $29.5 million, second low was $34.2 million and the high of three bids was $44.5 million. Government estimate on this first big federal plan in the Northwest since The Dalles was $31 million, according to the Walla Walla District of the Corps of Engineers.

The work to be done—inside a just-completed cofferdam—includes the powerhouse skeleton structure, 7½ spillway bays, south shore fish ladder and left bank abutment. Low bidder is a combination of five Pacific Northwest contractors—J. C. Montag and Sons, Portland; Carl Halvorson, Inc., Portland; McLaughlin, Inc., Great Falls, Mont.; Austin Construction Co., Seattle; and Babler Bros. Inc., Portland. Second low bidder was Guy F. Atkinson Co. of South San Francisco, Calif., in joint venture with Ostrander Construction Co. of Portland. High bidder was a combine known as Snake River Contractors consisting of Peter Kiewit Sons Co., Omaha; Morrison-Knudsen Co., Boise; Henry J. Kaiser Co., Oakland; Midvalley Constructors of Houston; and Condon-Cunningham Co., Omaha.

• **Some record-breaking features**—Ice Harbor is on the Snake less than 10 miles from its confluence with the Columbia. It will be a run-of-the-river power project with substantial navigation benefits. Basically, the $135-million project is a smaller version of McNary Dam. But it will have several features to distinguish it. The navigation lock will have a maximum lift of 103 ft—3 ft higher than the record Wilson Lock TVA is building in Alabama. The 10 tainter gates on the spillway will be 50x53 ft—also the biggest ever. And its 90,000-kw generators will be the largest driven by Kaplan turbines.

The navigation lock will conform with the size of the locks at McNary and The Dalles Dams—86 ft wide, 675 ft long with a 12-ft minimum depth over the downstream miter gate sill. (Plans are now under consideration for enlarging the locks at Bonneville Dam to meet these specifications so that uniform navigation conditions will prevail on the Columbia and lower Snake.)

The dam will be constructed straight across the Snake River with earth embankments flanking it on each shore. The navigation lock will be along the north shore where river depth is greatest. The 600-ft, 10-bay spillway comes next. It will have capacity of 850,000 cfs—maximum recorded flood is 409,000 cfs. The powerhouse will be located between the spillway and the south shore embankment. It will include provision for six units with only three units being included in initial construction. The additional units will be added when upstream storage makes it advantageous, although some contend that the capacity could profitably be used for peaking purposes as soon as the dam is completed.

First-stage construction will be accomplished inside the south shore cofferdam which is just being completed under a $1.4-million contract held by Guy F. Atkinson Co. Dewatering of the steel-cell and earth cofferdam started Dec. 14. First-stage work just bid includes 1,600,000 cu yd of excavation and 600,000 cu yd of concrete.

• **Second, third stages**—Construction scheduling is aimed at having initial power on the line in December 1961. To accomplish this, second-step construction is expected to be bid in May 1958 and to include the north shore embankment, the navigation lock, the north fish ladder and 2½ spillway bays. While the second-step construction is under way, the river will be routed through low sections in the previously built spillway.

Third-step contract will be bid soon after second-step work—probably in August 1958. This will include completion of the powerhouse and installation of the equipment. It will also include bringing up to full height the low spillway bays. While this is being done, the river will be routed through the three powerhouse bays reserved for installation of future units.

• **New bank protection**—a novel feature of the early construction work has been north-shore embankment protection. An ingenious "bedspring" secures a protective riprapping to prevent erosion when the river is diverted by the south shore cofferdam. This will divert the entire flow of the river at the damsite—flows have been recorded as high as 250,000 cfs—against the north bank.

The scheme consists of a steel mesh placed over the 1 to 2½ slope of the shoreline. First a layer of 6x6 in. steel mesh electrically welded is placed on the excavated slope and covered by a 2-ft layer of dumped rock with an 18-in. maximum to 6-in. minimum spread. Two layers of steel mesh are placed over the rock and anchored to the bottom mesh by tie rods ¾ in. in diameter on 4-ft centers both ways.

The wire-bound rock blanket is reinforced at either end by a dumped rock fill. The major portion of the steel-mesh-bound rock blanket will extend to bedrock and be slush grouted for the bottom 15 ft along the toe of the slope to prevent undermining by the river current.

Hydraulic model studies at the Bonneville Laboratories showed that even with curving the upstream corner of the cofferdam to minimize velocity, erosion of the north shore would be a problem. Engineers at first planned to meet the problem by excavating 500,000 cu yd for a channel. The excavation would be ultimately required, anyhow, for the lock. The model indicated that

measures in addition to excavating a channel would be necessary.

Ice Harbor is the first of an ultimate four lower Snake River dams. The other three—Lower Monumental, Little Goose and Lower Granite—will be similar in nature. That is, they will provide run-of-the-river power generation plus substantial navigation benefits. The Ice Harbor Project has been an authorized Corps of Engineers project for a good number of years. Several times during the Truman Administration the project was on the verge of construction. In 1950, the Senate approved $4 million in construction funds. But this was killed in a conference committee of Senate and House members with funds diverted to Chief Joseph and McNary. The Eisenhower Administration did not include Ice Harbor in its early program due to the "no new starts" policy. But the 1955 session of Congress appropriated a million dollars for initiation of construction, permitting award of the cofferdam contract. In 1956 an additional $8 million was voted which is being spent for relocations, completion of the cofferdam, and initiation of first-stage work.

Full Speed Ahead

States push plans to meet road program requirements

Mindful of the pressure for speed to meet requirements of the national highway program, states this week were moving ahead on two fronts—in providing financing, and in preparing and releasing plans for contract.

The area of planning—by far the most worrisome for the highway departments—received the most attention. One example of this was Wyoming, which announced formation of an Aerial Photography Division.

The new division will carry out preliminary surveys and locate materials deposits as well as work toward using the aerial photographs and mechanical computers for earthwork computations.

Other states confined their activities to contract work.

Arizona awarded its largest contract—moneywise—to Peter Kiewit & Sons to build Mule Pass Tunnel, on U. S. 80 near Cochise, on a bid of $1.98 million.

Wyoming let a total of 13 contracts, at a cost of $3.4 million, covering structures and roadbed improvements.

Pennsylvania happily announced that its long-planned $200-million Delaware Expressway—a 25-mile link between the new Walt Whitman Bridge at Philadelphia and the New Jersey Turnpike at Morrisville—will be built as part of the interstate system.

In Washington State, the Highway Department announced that its proposed 65-mile tollroad between Tacoma and Everett (through Seattle) would be built as a $194-million freeway under the federal act. The State Supreme Court had turned down the toll proposal as unconstitutional.

Delaware said it would go ahead with plans for a 13-mile link to the Delaware Memorial Bridge, regardless of whether Maryland finds money with which to build a connection to the road. And in Ohio, state planners ran into expected objections when they decided to include State Route 18 on the list for improvement under the new federal-aid provisions. Objectors were officials of the Ohio Turnpike Commission, who feared that a topnotch road paralleling the pike could seriously hurt the pike's business prospects.

• **Financing**—On the money side, these actions were notable: New Jersey's legislature approved a supplemental appropriation of $8.7 million to provide matching funds for federal contributions; Montana legislators received a two-year study of the state's highway problems, which contained recommendations that the state borrow $226 million over a 12-year period and pay for it through changes in its tax structure; a Wyoming legislative interim committee reported that taxes should be raised to produce an additional $1.5 million for matching purposes.

Cooper Union Plans Engineering Hall

A $3.5-million engineering-school building will be the main feature of a $7.5-million development and modernization program recently announced by the Cooper Union for the Advancement of Science and Art in New York City. The school's centennial, 1959, is the target date for completion.

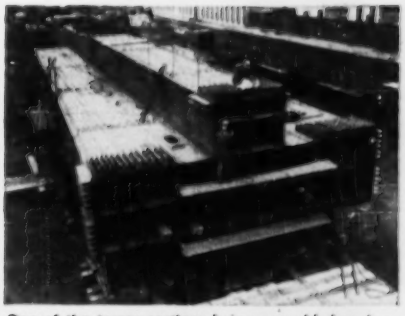
Designed by Prof. Esmond Shaw, head of Cooper Union's architecture department, in association with Harrison & Abramovitz, New York architects, the eight-story building will consist of four sections for laboratories, classrooms, offices and assembly rooms. One wing will be raised two stories above ground to provide a broad ground-level passageway between the street and a landscaped park.

Facilities will include laboratories, shops and drawing rooms for civil, chemical, electrical and mechanical engineering and nuclear science.

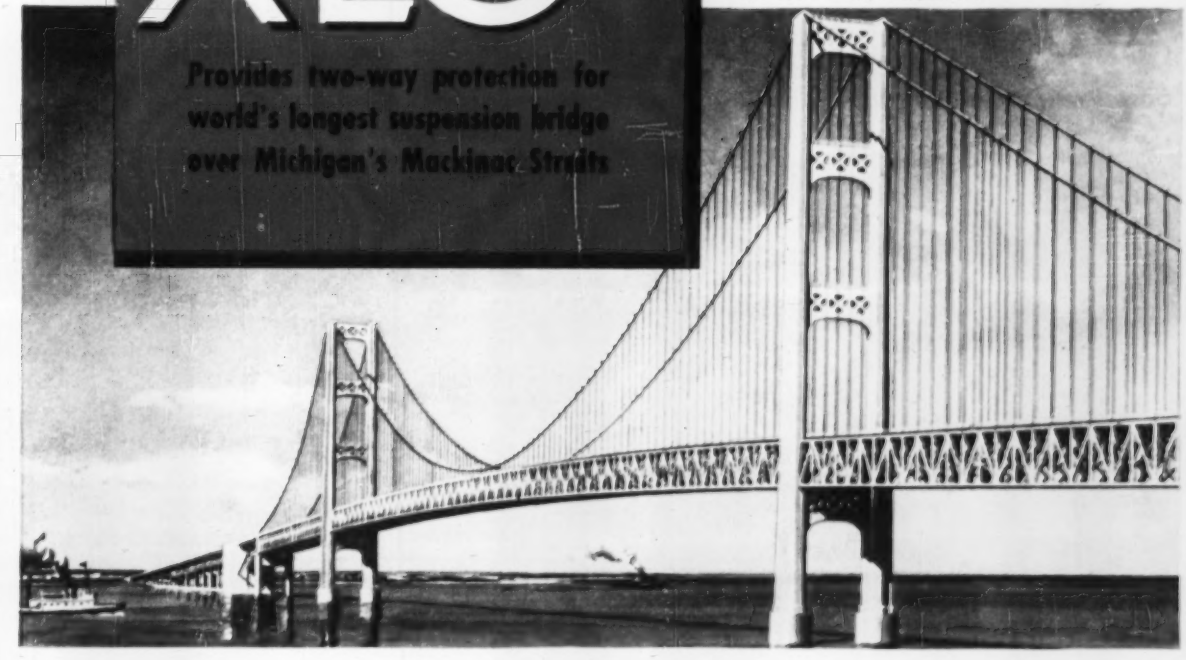
The building will occupy the site of the old Bible House, a New York landmark razed this year. Across the street from the site is the Cooper Union Foundation Building (lower left in photo), believed to be the oldest (1859) existing building with rolled beams.

Pittsburgh's X-L-O STRUCTURAL STEEL PRIMER

Provides two-way protection for world's longest suspension bridge over Michigan's Mackinac Straits



One of the tower sections being assembled at Ambridge Plant of the American Bridge Division, United States Steel Corporation.



1. Safeguards steel shapes against corrosion during transit and erection

2. Makes an excellent foundation for field painting

A 70-YEAR dream come true! That's the new five-mile bridge now being erected to link Michigan's upper and lower peninsulas. This huge project was designed by Dr. D. B. Steinman. The American Bridge Division, United States Steel Corporation, is fabricating the 75,000 tons of structural steel for its superstructure and major portions of the foundation caissons and cofferdams.

This giant project features a suspension bridge with a center span of 3,800 feet, two 1,800-foot side spans, and two 472-foot unloaded backstay spans. Total length, including anchorages, is 8,614 feet, making it the world's longest suspension bridge.

Structural shapes for this viaduct are shopcoated with Pittsburgh's X-L-O Primer to protect them against corrosion during storage, transit and erection. This remarkable finish eliminates need of costly metal cleaning. Its remarkable wetting characteristics assure uniform coverage even over surface irregularities caused by mill scale. Satisfactory through drying of film within twenty-four hours, regardless of weather, makes possible prompt shipment to job sites.

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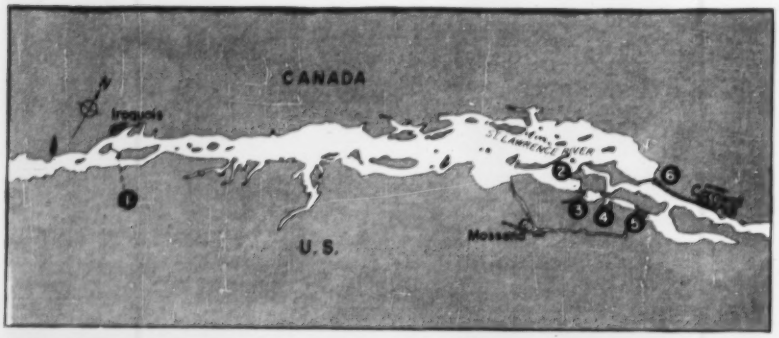
Key Year Ends: Picture Brightens on the

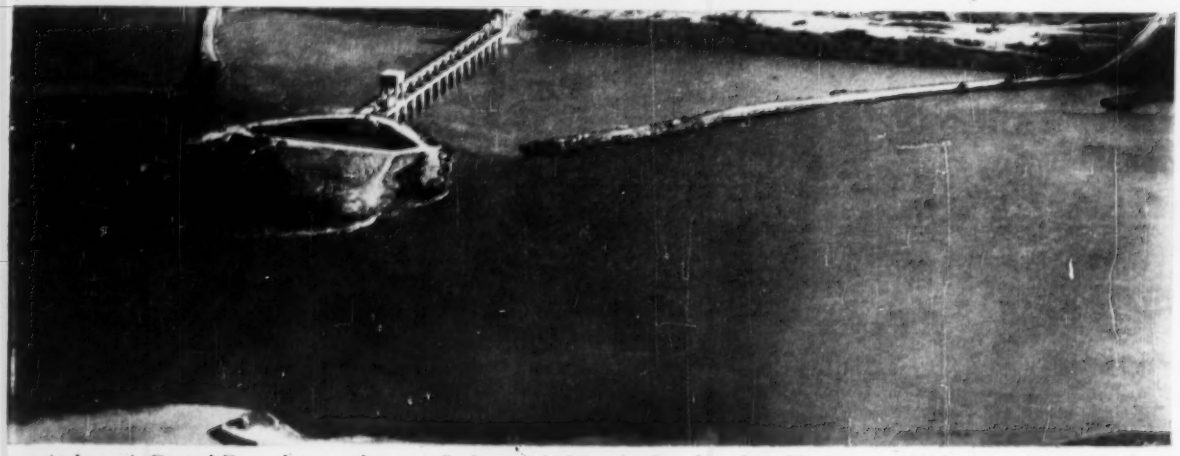


PROGRESS CAN BE TOLD IN TERMS OF SIX MAJOR PARTS OF THE PROJECT:

The key season of construction on the billion-dollar St. Lawrence Power and Seaway Project has ended—with almost everybody, but not quite everybody, pointing with pride at his progress, his schedule.

In general, on both the Power Project and the Seaway, there's reason for satisfaction with the season now ended.

It was a big year for concreting, with well over a million-and-a-half cubic yards placed in six major structures. It was a year in which extraordinarily good October weather made up for a wetter-than-normal summer in the fair-weather function of dike building. But it was



1. At Iroquois Control Dam, the second-stage cofferdam reached for the Canadian shore like a great pair of pincers as the river flowed through the completed portion of the gated structure and stage-one dikes extending back to the U. S. shore were removed.

3. Eisenhower Lock's resident engineer, Wayne Wolfe, saw his job grow to near 250,000 cu yd of concrete from a July start.

4. Long Sault Canal continued to be the sorest spot on the Seaway. Excavation of till was tough, costly, behind schedule.

St. Lawrence

a year in which the area's dense glacial till continued to cause headaches for low bidders on excavation.

Darkest spot remaining in a construction picture that has brightened, in general, during this key construction season is a $6½ million excavation contract on the Seaway Canal. The contractor has put in a $5½ million claim. His argument: the glacial till is "cemented." He has to shoot it.

The big problem from the start has been the heavy material being moved—generally the same dense glacial till that caused one contract default (ENR Oct. 13, 1955, p. 23)—and, to some small extent, the treacherous marine clay that helped put a second operation into bankruptcy (ENR June 28, p. 17).

• **Contrasting methods** — On the concrete work, the interesting contrast of U. S. and Canadian dambuilding methods continues to unfold at the international power dam.

Before the start of this past construction season on the U. S. side it was the cold-weather concreting of the Canadians in their winter-defying, twelve-month schedule that pointed up the contrast, while incidentally, putting the Ontario Hydro's contractor well ahead of his U. S. counterpart in yardage placed. But then came May 5 and the first placement of concrete on the U. S. half of this 3,200-ft dam. The contractor for the New York power agency had spread out the full length of his work with excavation and foundation grouting, so as to have a full 16-unit length of structure to take the concrete from his larger plant—through his shorter concreting season.

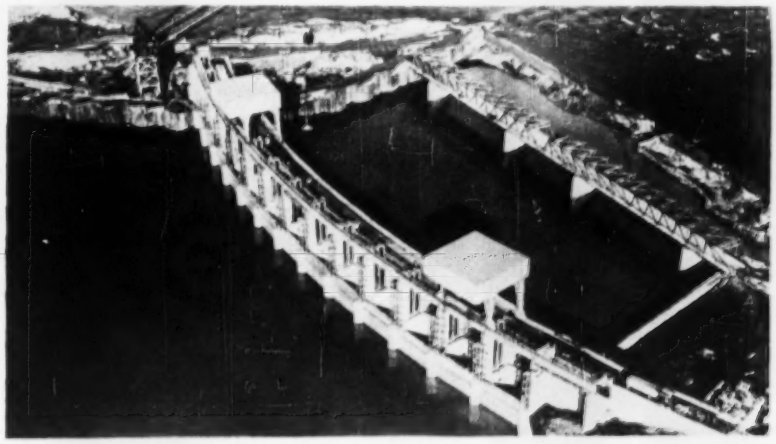
Further contrast was evidenced as "horizontal" U. S. construction on the powerhouse could be seen in juxtaposition to "vertical" work by the Canadians. Iroquois Constructors for the Ontario Hydro was building up height in relatively few units, while the U. S. joint-venture sponsored by B. Perini & Sons, Inc., spread its concreting horizontally over all 16 units. The difference is a basic distinction between dambuilding theories of the two countries.

• **Satisfying progress** — This "season"—call it the calender year in deference to the Canadians, as well as to the fact that excavation, cofferdam work and other incidentals go on incessantly on both sides of the river—saw the U. S. half of the power dam forge ahead of the Canadian half in total yardage.

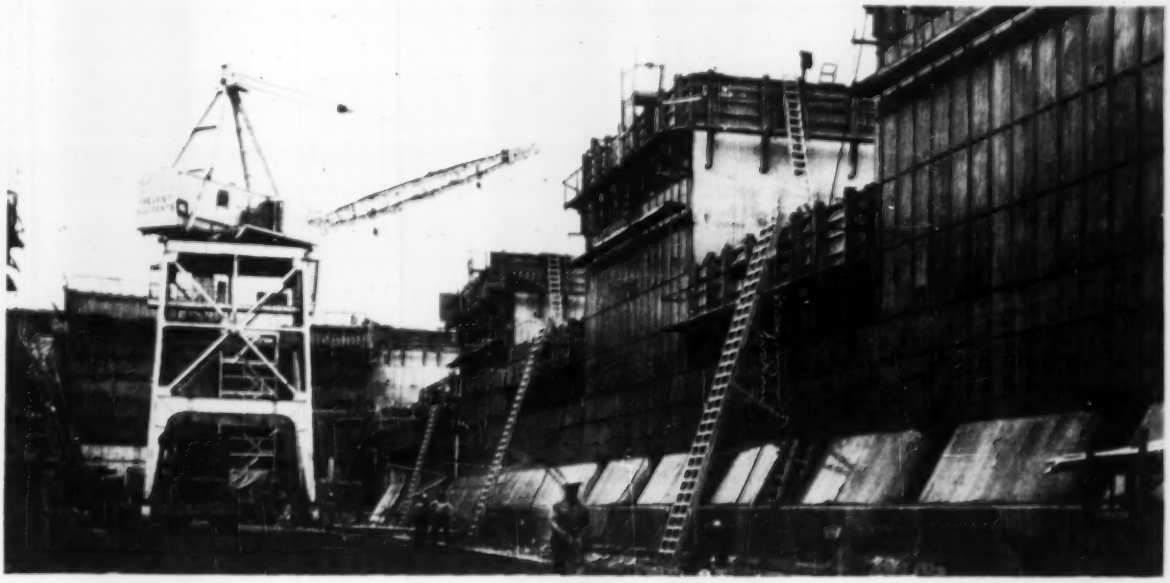
It saw completion of a concrete control structure in Canada through which a rerouted Cornwall Canal will flow next year, and by which this old 14-ft canal will be closed off eventually in favor of the new 27-ft Long Sault Canal.

It saw the contractor who had defaulted on lock excavation come back as a subcontractor to prove that his scrapers could move the glacial till at a profit—at the proper bid price.

In all, with the progress pictured here, the season saw the billion-dollar St. Lawrence project move ahead to about 40% of completion.



2. Long Sault Spillway Dam was readied for its function in the diversion scheme (ENR Oct. 18, p. 30). Temporary bridge will provide access to second-stage work here.



5. Grass River Lock was a smooth concrete project where there had been a rough (marine clay) excavation job. Started after Eisenhower Lock, it, too, grew to over 200,000 cu yd in a season that went on into this month of December with winter concreting operations.

(Continued from page 29)

6. THE POWER DAM

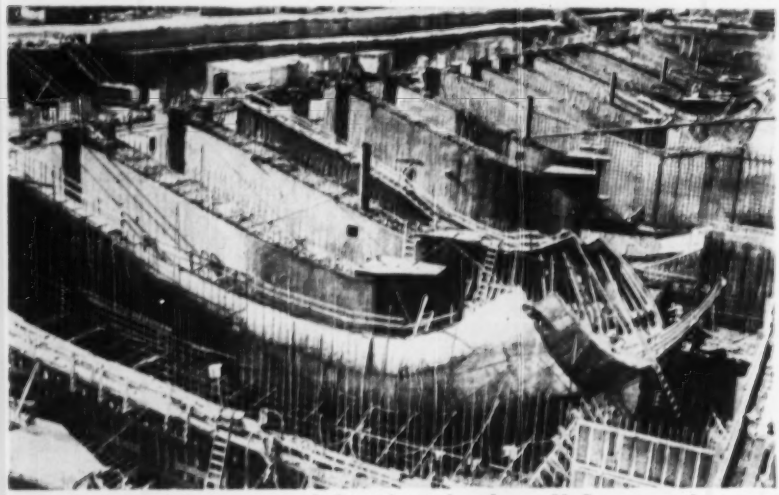
It was U. S. vs. Canada as the differences in construction methods, and schedules began to take form.

As Barnhart Island Power Dam rose from its foundation in this construction season, very significant differences between U. S. and Canadian concrete dam design and construction became apparent.

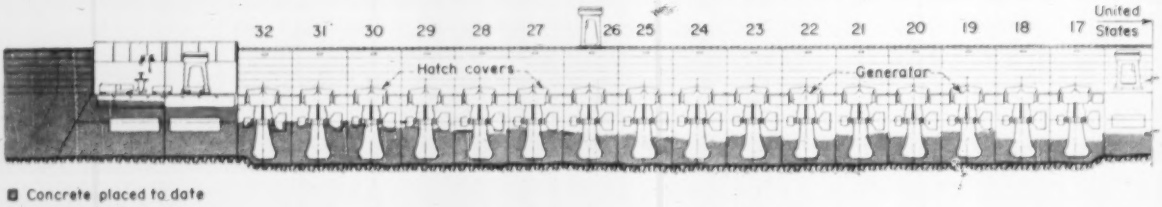
When this power dam is done, flags of the two countries undoubtedly will mark its two halves, and it is said that a slight line of color demarcation may be discernible at the international border due to the aggregate and cement for each half having come from separate sources. But right now, the different appearance of the two halves of dam being built is startlingly evident, and important for its basic reasons.

From the start of excavation, the U. S. dambuilders have spread themselves out along the entire length of their half of the 32-unit structure. The Canadians, by contrast, had to strive toward completion of blocks nearest their shore, blocks that must key into a relatively high earth dike there. (This dike has a critical completion date; it will cut across the existing Cornwall Canal, so its construction is tied into continued use and eventual abandonment of that canal.)

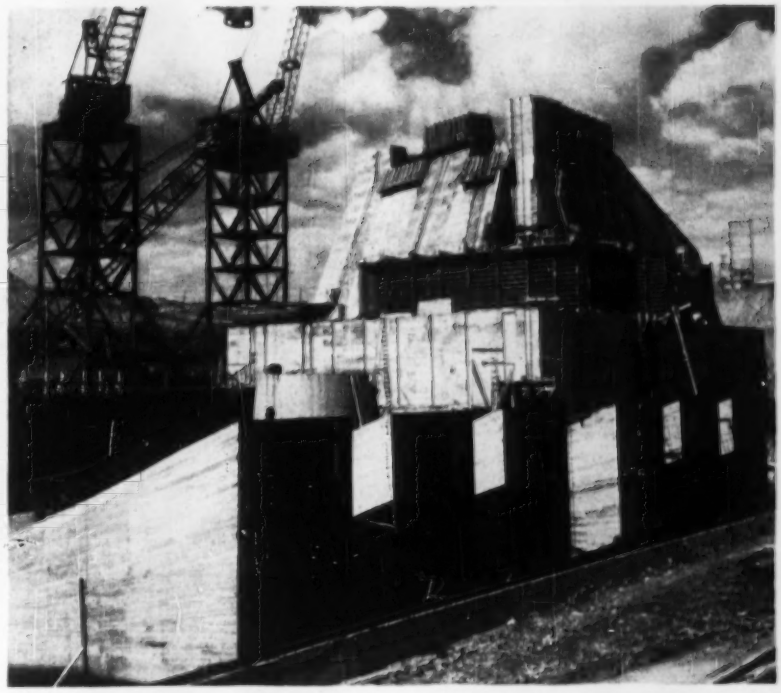
But even with these first blocks at the end of the dam complete and towering over all else on the Canadian side, the contractor for Ontario Hydro continued, very obviously to concentrate his concreting operation on relatively



U. S. Steel draft-tube forms spread along the work and gave U. S. contract the appearance of horizontal construction.



THE INTERNATIONAL POWER DAM is split in the middle at the U. S.-Canadian border, in ownership and therefore in



CANADA Wood forms, high pours, and concentration until recent weeks, on the first few units, made Canadian work look vertical by comparison.

few blocks. Not until November did he put more than a small amount of concrete in blocks beyond No. 6.

In contrast, the builder for PASNY (Power Authority of the State of New York) is forming, or has formed, draft tubes in every U. S. unit, with concrete brought well off rock all the way across from No. 17 to 32.

Canada is building vertically, while the U. S. builds horizontally. What's back of this difference?

Basically, two things: Ontario Hydro's high pours, way higher than the standard 5-ft lift in U. S. practice; plus the Hydro's winter concreting.

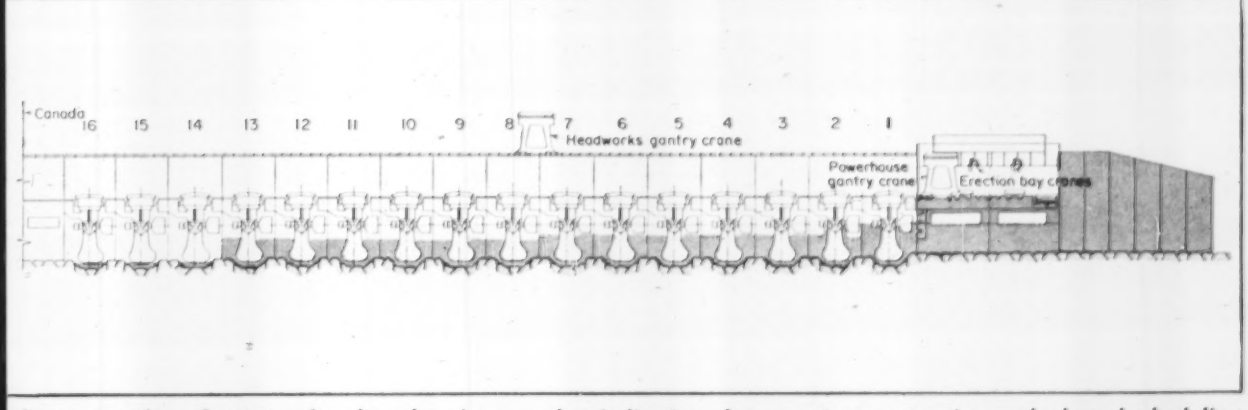
Because of their recognized practice of pouring concrete lifts to almost unlimited heights—20, 30, even to 60 ft on earlier jobs—they design construction joints as suits them best, not just every 5 ft. This means that forms for draft tubes and scroll cases must be complete units, constructed in wood according to usual practice. And as a second reason for sticking to the time-tested wood forms and pouring each unit's concrete totally about them, Ontario Hydro engineers point out that with their winter concreting, they need the insulating value of wood forms as well as the internal heat of massive high pours.

On the other hand, the Perini-sponsored joint venture (contractor for PASNY) can take good advantage of steel forms, the labor-savings and speed they make possible. Piers, walls, roofs and the rear elbows of draft tubes can be formed and poured in low lifts, with the forms able to be moved quickly along the power dam, unit to unit, in a fast cycle of reuse.

Because there are turbines of two different manufacturers going into the U. S. half of the power dam (Baldwin-Lima-Hamilton and Allis-Chalmers), draft tube requirements differ slightly, and two separate sets of steel forms had to be made, each to get eight uses.

(As another more than incidental difference between forming practices, the U. S. dambuilders bring their formwork right up to unit level, later to set the units into the completed concrete structure. In contrast, the Canadians set up their units and concrete around them, embedding them in place.)

• **Steel forms mean speed**—Einar Skinnarland, project engineer for Perini, expresses great pleasure with the way the steel forms—by Blaw-Knox—have worked out. Once they got going with the forms, his forces were able to get one complete use of each set of forms



its construction. Concrete placed to date is somewhat indicative of contrasting construction methods and scheduling.

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Being a rigid type of centering, Ribform never need be stretched during installation. It cannot twist or deform the joists. No expensive temporary bracing is required.

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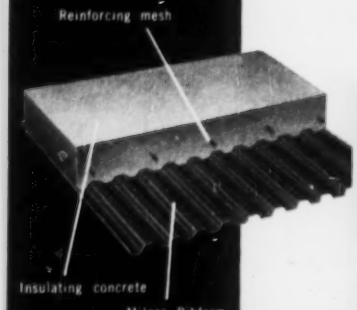
See our insert in Sweet's (Architectural or Industrial Construction) File, or send for Catalog No. 245.

MILCOR® Ribform



Ribform is easy to handle. Just weld it to the joists —the rigid sheets need no supplementary bracing.

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M-176A

every three weeks, as compared to a possible seven-week cycle on wood forms. The steel forms, of course, were designed specifically for this structure—for its exact configurations and its construction joints. This meant the form design had to await final dam design, and Engineer Skinnarland points out that the form supplier had precious little lead time for design and manufacture before delivery of the product.

Steel draft tube forms have been used on only two other U. S. dams before—Chief Joseph and The Dalles.

From his Canadian-shore construction office, Project Manager Lazier of Iroquois Constructors watches the U. S. use of steel forms with more than casual interest. Soft-spoken Tom Lazier is non-committal on a comparison of methods at this point, but he does look forward to a chance in the future to sit down with his friends across the river for a comparison of cost figures on steel vs. wood forms.

Meanwhile from their vantage point on the south shore, U. S. construction men watch and learn as the Canadians now enter upon their second winter of concreting operations at the St. Lawrence power dam, a winter that should once again put them ahead of the U. S. in concrete placed in the structure. Belt-conveying their concrete—as they have for years, to the horror of many U. S. dambuilders—the forces for Ontario Hydro are once again working under wraps in the long, cold winter.

Small Size Street Sewer Pipe Studied for Dependable Data

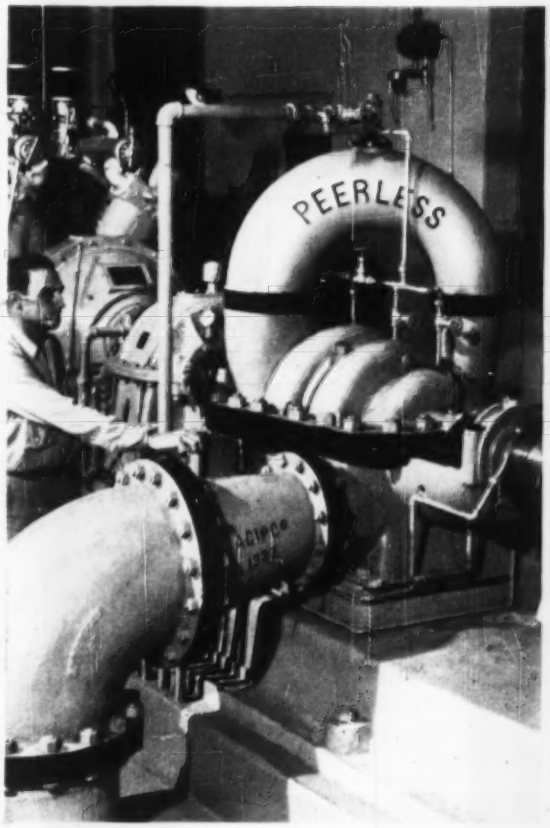
A Building Research Advisory Board study is under way to give the Federal Housing Administration dependable data on small-size, 8-in. or less, residential street sewer pipe. The study will determine: (1) whether residential sewers are being built larger than necessary, (2) whether overdesigning, if indicated, has meant unnecessary expense, (3) if small-size pipe is feasible in view of frequent terminal extensions necessary to serve additional housing, and (4) if small-size pipe requires impractically steep grade.

The BRAB committee doing the study has surveyed federal, state and municipal authorities, consulting engineers, research institutions and manufacturers to find out: how much, and under what conditions, less-than-8-in. pipe is used; experiences with design and construction practices such as grades, joints, manhole spacing, etc.; operating and maintenance experience with 8-in. and smaller sewers.

FHA's interest and concern with sewage systems relating to individual dwellings and privately owned community systems, prompted the study.

Dependability in action

THIS 20 YEAR OLD VETERAN HAS PUMPED 1,000,000 GALLONS A DAY EVERY DAY WITHOUT REPAIRS



No wonder the city officials and the 12,000 citizens of Boone, Iowa like this Peerless pump. For dependability and economy it has established a remarkable record rarely matched in municipal water pumping service: it has pumped a million gallons of water every day for 20 years *without repairs*. The only pump maintenance required has been the replacement of stuffing box packing and periodic lubrication.

At Peerless Pump we think this installation summarizes all the reasons for specifying and installing Peerless vertical and horizontal pumps. We assure you: if you want unexcelled performance, matchless economy, sound design, skilled construction and expert installation service Peerless is the line from which to specify *all* your needs for pumps.

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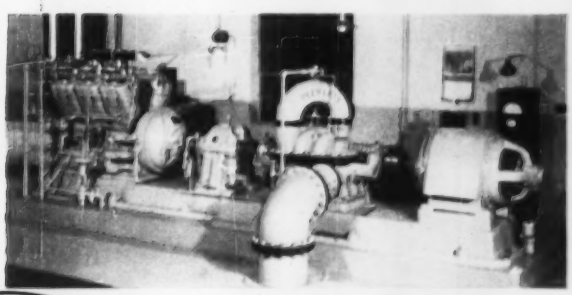
HERE'S THE RECORD

TYPE: Peerless Type TU; 2-stage horizontal pump.
OPERATOR: City of Boone, Iowa.
LOCATION: Des Moines River.
INSTALLED: 1937; in continuous operation for 20 years.
SERVICE: Supplies 90% of City of Boone, Iowa, water supply.
CAPACITY: 2000 gpm.
HEAD: 485' TDH.
DRIVES: Dual power drive; GE electric motor, Le Roi engine.
MAINTENANCE RECORD: No shutdowns for repairs. Replacement of packing and lubrication only maintenance performed.



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Cuban experience with prestressed concrete hollow-box bridges over the past four years points the way to more economical bridge construction in the U. S.

CANAS BRIDGE, first prestressed box girder bridge in Cuba, spans 249 ft, has 50-ft anchor arms. Design was improved in later structures.

What You Should Know About . . .

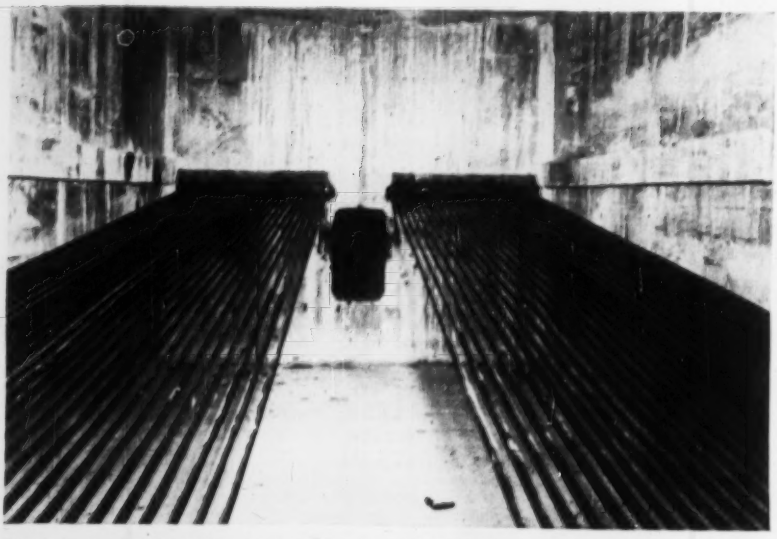
Design of

H. Kent Preston
Engineer
John A. Roebling's Sons Corp.
Trenton, N. J.

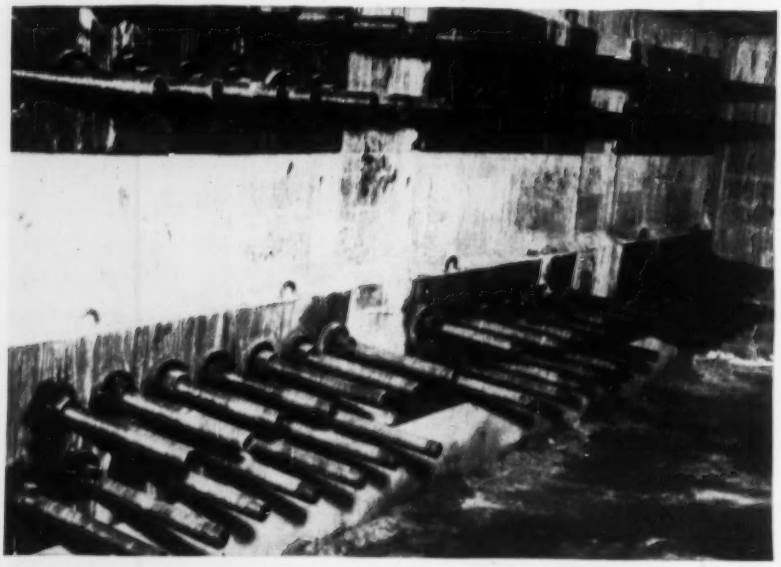
Prestressing techniques originally developed in the U. S. have been adapted by Cuban engineers to hollow-box concrete girder bridges that show savings in construction costs. Studies indicate that the same techinques also could lower construction costs here.

The Cañas River Bridge in Cuba, completed Dec., 1952, was the first hollow box to utilize the advantages of galvanized steel strands, which have long been a component of American suspension bridges. Of deck-girder construction, with the top of the cells forming the roadway, this bridge has three continuous spans—a 249-ft center span and two 50-ft anchor arms. The center span has a constant depth of 12 ft.

Inside each box were placed fifty-six 1-in. dia galvanized strands. Draped in a vertical curve to vary the prestress along the length of the girder with the variation in stresses produced by the loads, the strands were tensioned initially to 140,000 psi (anticipated loss, 25,000 psi), and anchored at the ends of the girder by tightening nuts on threaded swaged fittings.

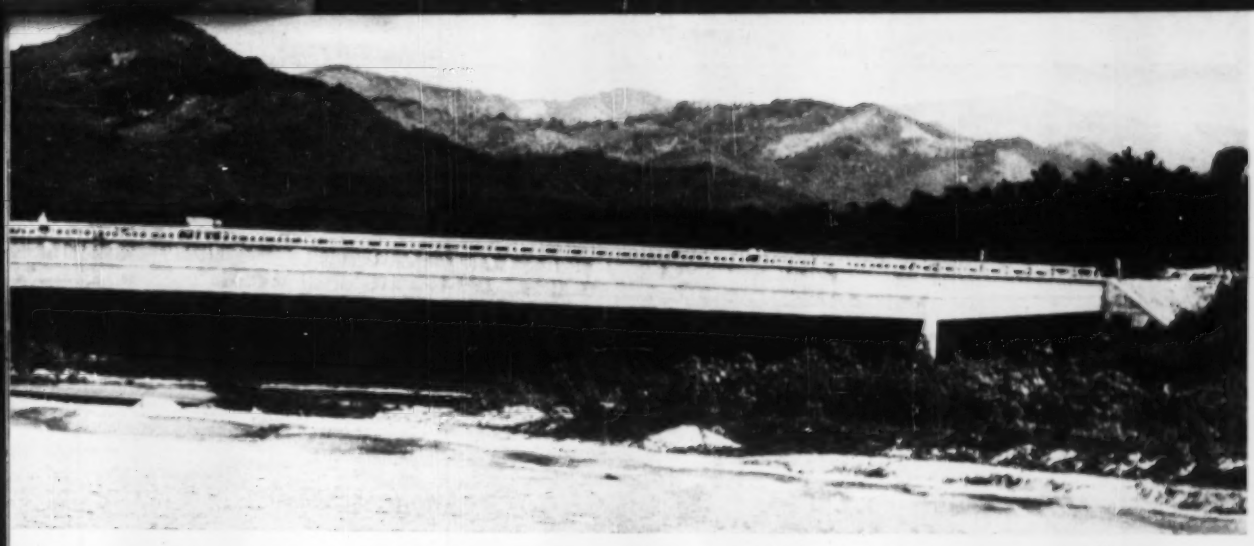


INSIDE A GIRDER strands are easily accessible for inspection. At diaphragms, they are held in position by cast iron saddles.



END ANCHORAGE of the tensioned strands is achieved with nuts on threaded fittings tightened against bearing plates.

• **Advances in design**—Succeeding Cuban bridges—Agabama, with 131-ft center span, in 1953; Arimao, with a 200-ft center span, and Cuyaguateje, with a 295-ft center span, in 1954; Felipe Pazos, continuous over three 152.5-ft spans, completed this year—have resulted in more economical design details and architectural improvements, such as arched soffits. Most significant of the advanced design techniques is the discovery that savings can be achieved by using larger diameter strands.



Prestressed Hollow-Box Girder Bridges

Freedom from maintenance first attracted Cuban engineers to prestressed concrete. In their climate, steel requires continuous attention; yet the need for new structures often seems more important than the painting of existing ones, which, when neglected, deteriorate. In prestressed bridges, all the concrete in the superstructure is under constant compression, and therefore crackless.

The post-tensioned strands, composed of hot-galvanized wires are extremely durable. (During a recent inspection of the Brooklyn Bridge, in New York City, a suspender of similar material, removed for test after 60 years' service, was still in satisfactory working condition.) Since the strands are completely accessible within the hollow boxes, they can be inspected and, if necessary, painted.

• **Key elements of design**—A cost analysis of the latest Cuban bridge—Felipe Pazos—shows that a similar structure can be built in the U.S. for a lower cost than with other standard structural materials. The Felipe Pazos bridge is designed to carry two lanes of H20 loading. If a similar bridge were to be designed to carry the standard U.S. loading, H20-S16, here would be the key factors to be considered:

▶ The bridge would consist of a three-cell girder continuous over three 152.5-ft spans. Significant details are shown in elevation, cross sections and end view on p. 36. It would carry two 12-ft traffic lanes on the top flange and two 4-ft cantilevered sidewalks.

Concrete would be specified to have a minimum ultimate compressive strength of 4,000 psi. Final stress in the galvanized strands at the center of the bridge would be assumed at 115,000 psi. No tension would be permitted in the concrete due to bending stresses under 1.2 times dead load plus twice the live load and impact. (This is a conservative assumption arbitrarily established in the absence of any previous designs of this particular type.)

▶ Roadway and sidewalk widths determine the width of the top slab. Its thickness and reinforcing must be sufficient to distribute wheel loads to the vertical webs.

▶ Depth of the girder at the piers may be between 4% and 5% of the span. For preliminary calculations, a constant depth can be assumed to simplify the computations. Later, the figures can be corrected for a curved soffit, the original depth being increased at the piers and decreased at midspan.

▶ Thickness of webs and bottom slab usually is the minimum that can be concreted satisfactorily. Reinforcing is nominal.

▶ Strands should be located as high as possible over the piers, where maximum negative bending moment occurs, and as low as possible at points of maximum positive moments. The center of a 1⅛-in. dia strand can be located 4 in. from the inside surface of the top or bottom slab. (This clearance is needed for the end fittings on the strands.) Experience indicates that the "in-place" cost of a small number of large strands is less than the cost of a larger number of small strands delivering the same prestressing force.

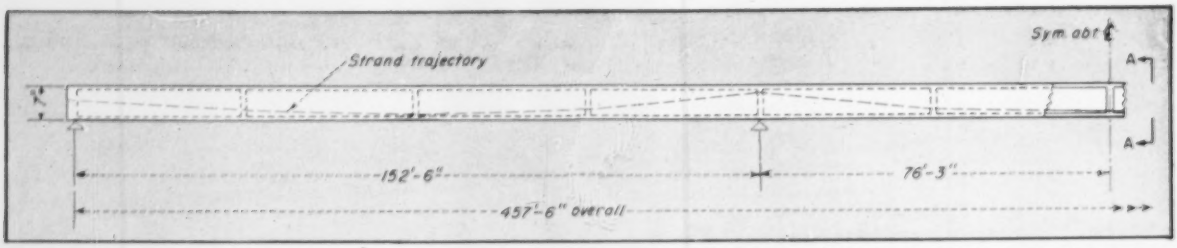
▶ Since the dead weight creates a large portion of the total moment, it is desirable to locate the piers so that there is considerable negative moment in the girder above them. In the Canas bridge, for example, short cantilevers at both ends of the main span develop the negative moments at the piers. However, three equal spans give a more economical design for continuous multi-span structures as far as superstructure cost is concerned.

▶ Diaphragms usually are placed at the quarter points and center of each span. However, they are seldom less than 35 ft or more than 50 ft apart.

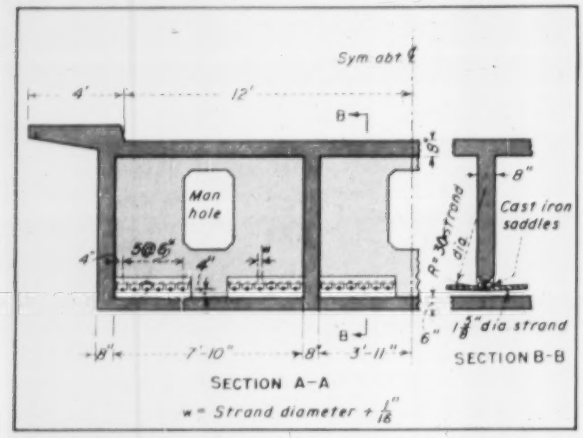
▶ If y is the rise of the strand between midspan and pier, then the rise at the quarter-point should be 0.25 y.

• **Construction considerations**—After

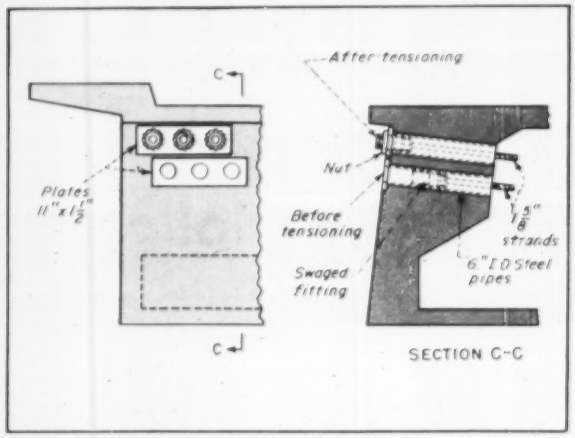
IMPROVED DESIGN in a later Cuban bridge (Cuyaguateje River Bridge, 1954) includes curved soffit and more economical size strands.



ELEVATION of a three-span box girder shows the strands placed high in the cells over the piers, low near midspan to vary the prestress.



AT MIDSPAN, strands are held 4 in. above the bottom slab at the diaphragm to pass strand fittings under the saddles.



AT GIRDER ENDS, tensioned strands pass through pipe sleeves in the end diaphragm and are anchored by tightened nuts.

the concrete superstructure has been fabricated—by any means that proves most economical—the strands can be installed. The reel on which the strands are wound is mounted on a shaft at one end of the bridge. Then the strands are threaded through pipes in the girder end and on through the cells to the other end. At diaphragms, the tendons are held in position by cast iron saddles.

Each strand should be tensioned from both ends simultaneously to minimize friction losses. Three or more days after initial tensioning, strands should be retensioned to minimize stress loss from creep of the steel, plastic flow of the concrete and friction. Between the greased, machine-made galvanized strands and the cast iron saddles friction is so small that it is not necessary to use a hinged strut like that described in the article, "Cable Trusses Prestress Bridge" (ENR April 30, 1953, p. 50). After installation, all strands should be cleaned and painted.

• **Stress computations**—For structures in which tendons are continuous over a pier, the familiar formula for concrete stress due to prestressing force, $f = F/A \pm Fe/Z$, does not apply. Instead, the following procedure may be used:

1. Assume a final tension, F, of 1,000,000 lb.

2. Compute the vertical loads due to F that act at each diaphragm.

3. Compute the stresses in the structure due to those vertical loads.

4. Compute the direct compressive stress, F/A, and add it algebraically to the stresses previously obtained (Item 3). The result is the net stresses due to F. (A is the cross sectional area of the girder.)

5. Calculate the stresses due to dead and live loads. Ascertain that no tension will occur in the concrete under specified combinations of these loads.

6. Divide these stresses (for critical sections) by the net stresses due to F and multiply by 1,000,000 to obtain the net prestressing force required. From this, the numbers of strands needed can be deduced.

• **Pier reactions**—Since the strands carry some of the shear, the pier reactions in a three-span bridge are not the same as for an unprestressed structure with the same elastic properties. The reactions can be determined as follows:

1. Compute dead-load reactions on the piers due to dead load as would be done for a structure having the same elastic properties as the concrete girder section.

2. Compute the reactions at the piers due to the upward forces of the strands at the diaphragms.

3. Compute the reactions due to the downward forces of the strands over the piers.

4. Add the reactions calculated in items 1, 2 and 3 to obtain the dead-load reactions.

5. Live-load reactions will be the same as for a structure with the same elastic properties.

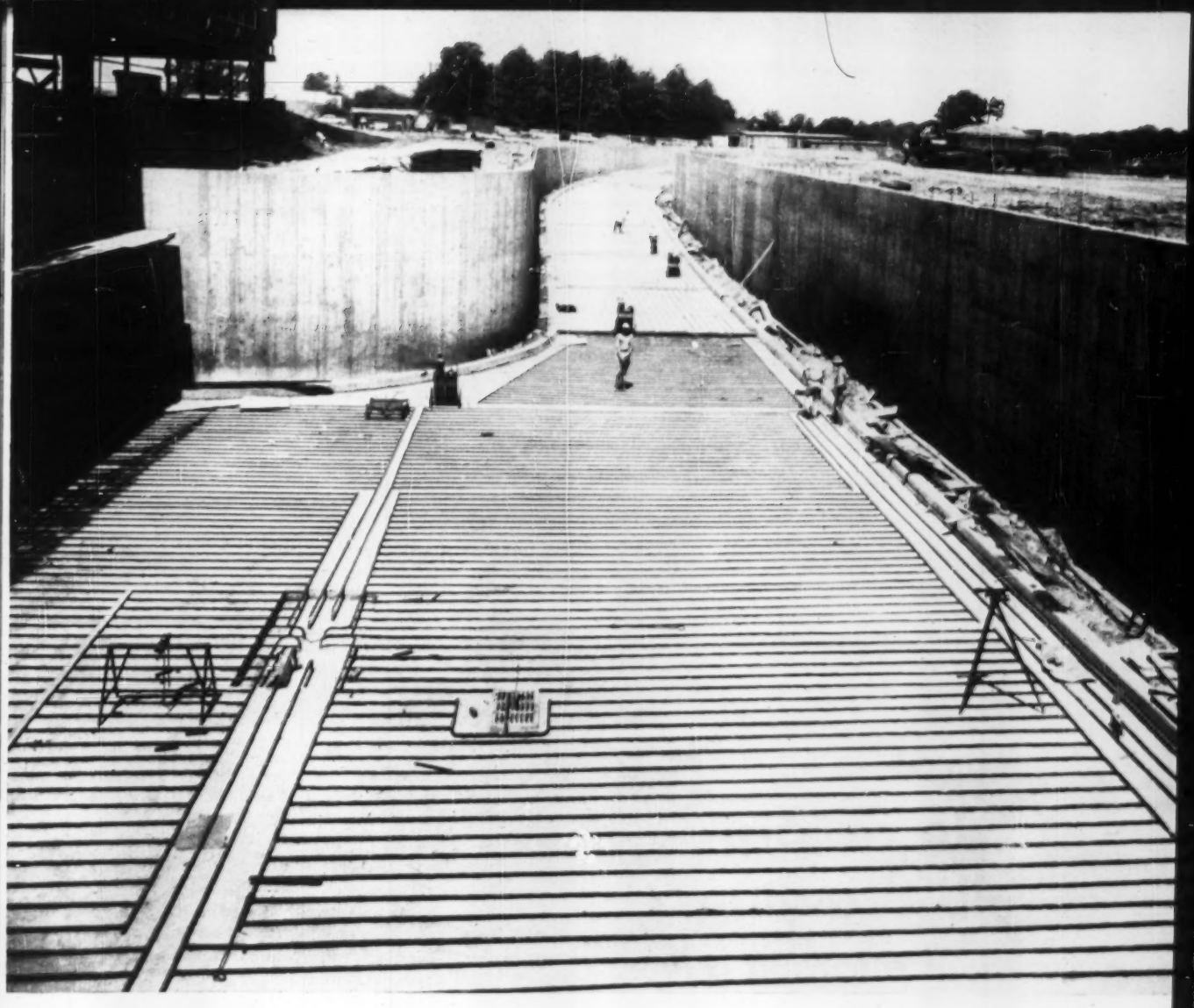
• **Cost analysis**—Cost of the 457.5-ft superstructure is estimated to be:

925 cu yd of concrete at $175 =	$161,875
76.5 tons of reinforcing at 13c =	19,890
45.45 tons of strand at 55c =	49,995
Total	$231,760

The cost averages $506 per lin ft.

In this estimate, the item for strands includes the tendons, fittings, bearing plates and saddles, plus placing and tensioning costs. It is based on the bare weight of strands not including fittings —thirty-six 1⅛-in. dia strands at 5.52 lb per ft x 457.5/2,000 = 45.45 tons.

The first four Cuban bridges were designed by engineers of the Comision De Fomento Nacional of Cuba under the direction of Luis Saenz. Placing and tensioning of the strands was supervised by the author in the first three structures and by L. E. Hill of the Roebling corporations in Cuvaguateje. The Cuban engineers are supervising the installation of strands in Felipe Pazos, which was designed under the direction of Luis Saenz, Mario G. Suarez and Jose A. Marti.



Built-in snow removal called for piping dependability —they used Wrought Iron

Not just snow melting—but *dependable* snow melting—was the leading design objective for this access ramp.

That's why designers of the new Connecticut General Life Insurance Company office building gave such careful consideration to material selection for this access ramp. Four major factors supported the use of wrought iron for this job: its corrosion-resistance—rugged strength—low coefficient of expansion with concrete—ease of fabrication.

In addition to snow melting service, wrought iron pipe was also installed for well water and cold water lines, chilled water mains, and well water piping in the heating and cooling system. Our booklet, "Byers Wrought Iron for Snow Melting Systems," offers case-history support for wrought iron's reliability in this service. Write for a copy.

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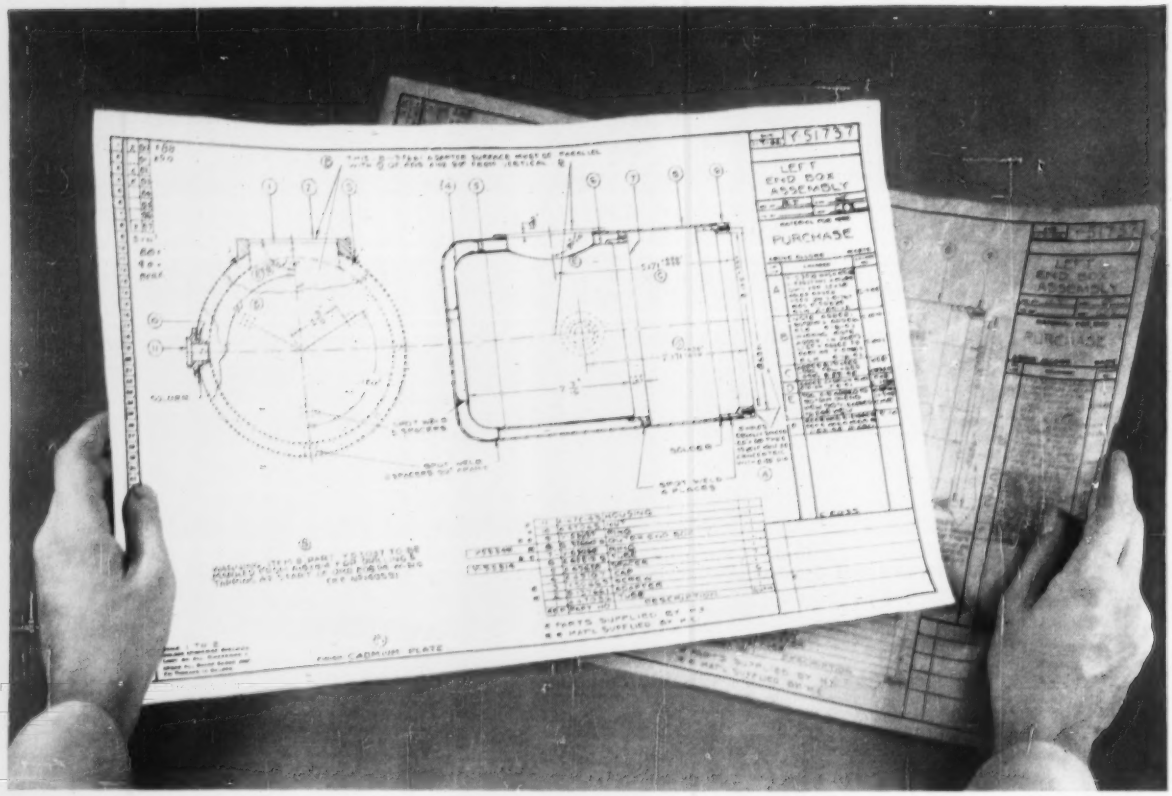

This Autopositive Paper intermediate was made from an old, "yellowed" drawing

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without retracing a line

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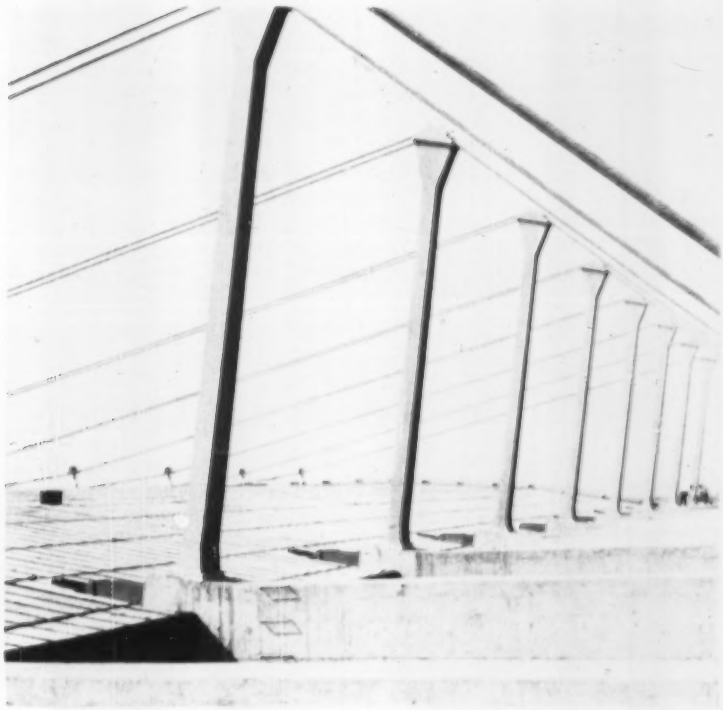
SADDLING a 2⅞-in. dia steel cable on a rooftop post marks start of . . .



SUSPENSION of a 270x130-ft concrete-decked hangar roof with ten pairs of cables anchored to a concrete leanto.

Cables Support 130-Ft Hangar Roof

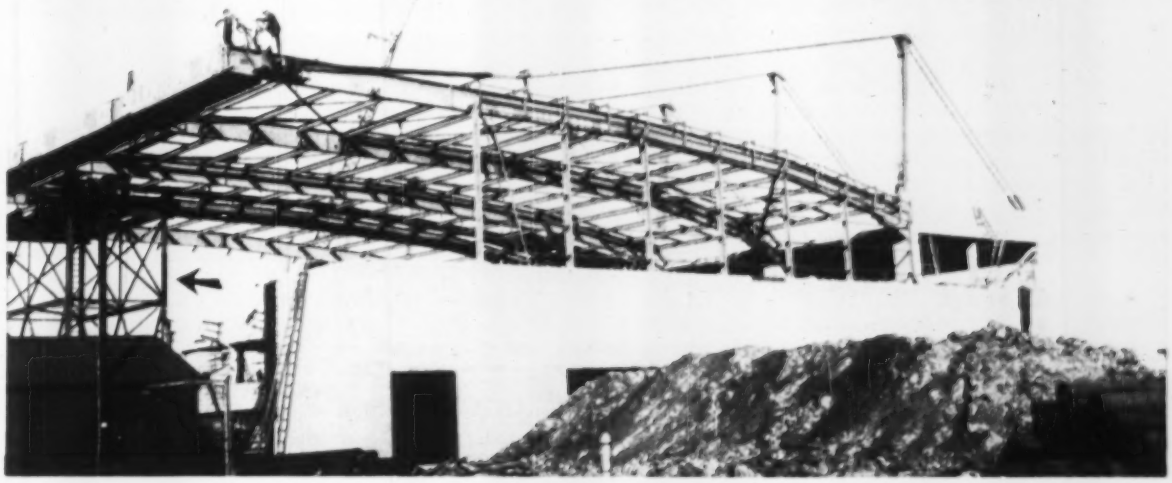
The roof of a new Trans World Airlines maintenance hangar at Philadelphia International Airport is supported in an unusual way to eliminate supports from the interior. Ten pairs of steel cables, anchored to the roof of a reinforced concrete leanto at the rear of the hangar, curve gracefully over a rooftop mast and reach out 125 ft to hold up the 130x270-ft projection.

The resulting unobstructed floor area will enable TWA to service the newest jet airliners and Super-G Constellations. When the length of the hangar is eventually extended to 540 ft, as anticipated, the unobstructed area for servicing will be doubled.

The cable-suspended roof has a deck of precast concrete channel slabs. This construction was selected because the concrete units met a minimum-weight requirement of 14 psf, needed for resistance to uplift due to wind (ENR Jan. 26, 1956, p. 48).

The slabs rest on steel purlins that span 30 ft between 36-in. wide flange beams, or ribs. In turn, the ribs are supported at one end by the leanto and at the outer end by the cables.

Each of the cables is 2⅞ in. in



FALSEWORK (arrow) supported the outer end of the steel roof framing until the cables were tensioned. Structural steel under the end rib was provided to support curtain walls; it is connected to the rib by a slip joint.

diameter and carries a total stress of 196 tons. The horizontal component of the cable tension is taken by the ribs, which carry relatively high bending moments as well as this sizable axial compression. Hence, it was necessary to reinforce the standard sections with light cover plates in critical areas.

Though the roof curves, rising from a height of 38 ft at the leanto to 47 ft at the front, the ribs are composed of three straight chords, with splices at points where they change direction. One field splice was necessary because of restrictions on length to meet shipping requirements.

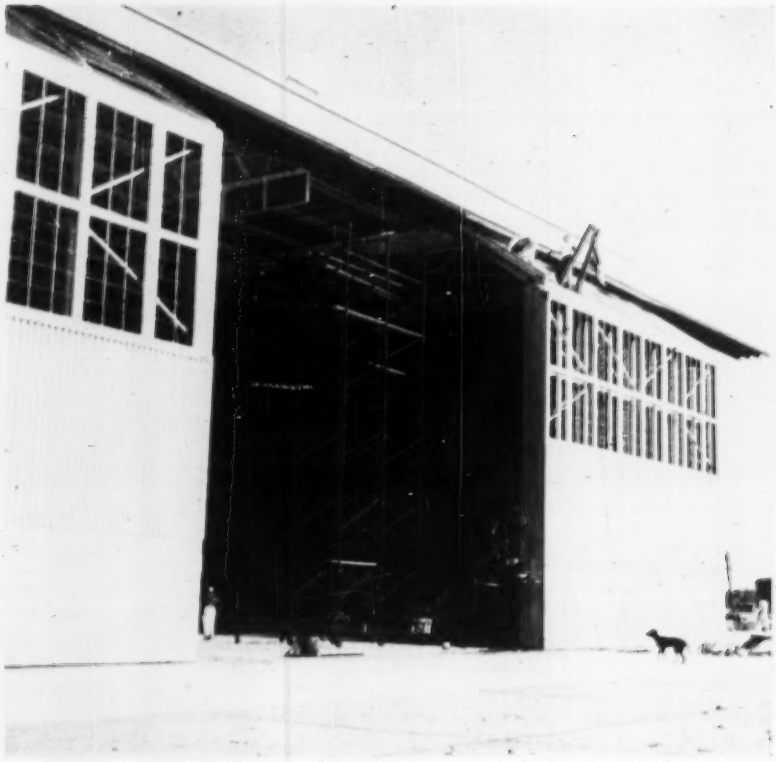
• **Stability built in**—according to design calculations, the uplift at a wind velocity of about 120 mph equals the dead load of the roof. Since the cables cannot take compression, the ribs acting as cantilevers, will have to resist the pressure at higher velocities. Therefore, a moment-resisting connection is provided between these members and the concrete leanto.

The connection for each rib was made with four 3-in. dia high-strength bolts, while the outer ends of the beam rested on a steel-framed falsework bent. After the ribs were aligned, the bolts were tensioned. Primarily, the purpose of the prestress is to reduce rotations at the connection under load, but it also assures favorable stress conditions for transmitting shear under all loading conditions. After the ribs were suspended from the cables, the falsework was removed.

• **Hanging the roof**—Cable stringing began as soon as two of the ribs and the purlins between them were erected. A crane set the cable reel atop the steel framing. Then, two cranes were used to help unreel the cable, one supporting the strand, the other hooked to the periphery of the reel to provide the unwinding action. High winds complicated the unloading; despite the weight and stiffness of the cable, the reel was twisted from side to side. A full crew was necessary to keep the cable in alignment during the unreeling.

Ten 28-ft high steel posts were set at 30-ft intervals atop the inner legs of the concrete leanto to support the cables. Each post carries two cables. A crane, equipped with a spreader to prevent the strand from kinking, placed them on the saddles on top of the posts. A saddle cap then was bolted on each.

At the outer ends of the ribs, each cable was attached to a 4-in. dia high-strength steel stud 29 ft long. At the anchorage, it was fastened to an 11-ft stud. Finally, tension was applied to the cables, lifting the ends of the ribs from the falsework, after which the precast concrete roof deck was placed.



DOORS are constructed with a horizontal joint to permit sizable roof movement.

• **Leanto serves dual purposes**—The leanto, which provides the anchorage, is only about 40 ft wide. Relatively narrow for resisting overturning under dead and snow loads on the long-span hangar roof, the leanto required heavy framing for stability. In addition, it is supported on steel H-piles driven 65 ft into the ground, those under the outer legs being capable of resisting the uplift.

The leanto provides space for parts and storage room, clerical offices, foreman's office, mechanical room for utilities, transformers and heaters, paint shop and entrance lobby. Another leanto, along one end of the building, provides for a truck entrance, fleet service room and inflammable storage quarters, with a 10,000-gal fuel-oil tank under the floor.

• **Novel installations**—The hangar has six motor-operated steel doors, each 45 ft long. Since the outer edge of the roof may deflect perhaps as much as 15 in. up or down under wind pressure, the doors have a horizontal joint near the top, and the upper portion slopes inward to ride the guide rails, readily fluctuating with roof movements. At the bottom, door tracks may be heated to prevent icing.

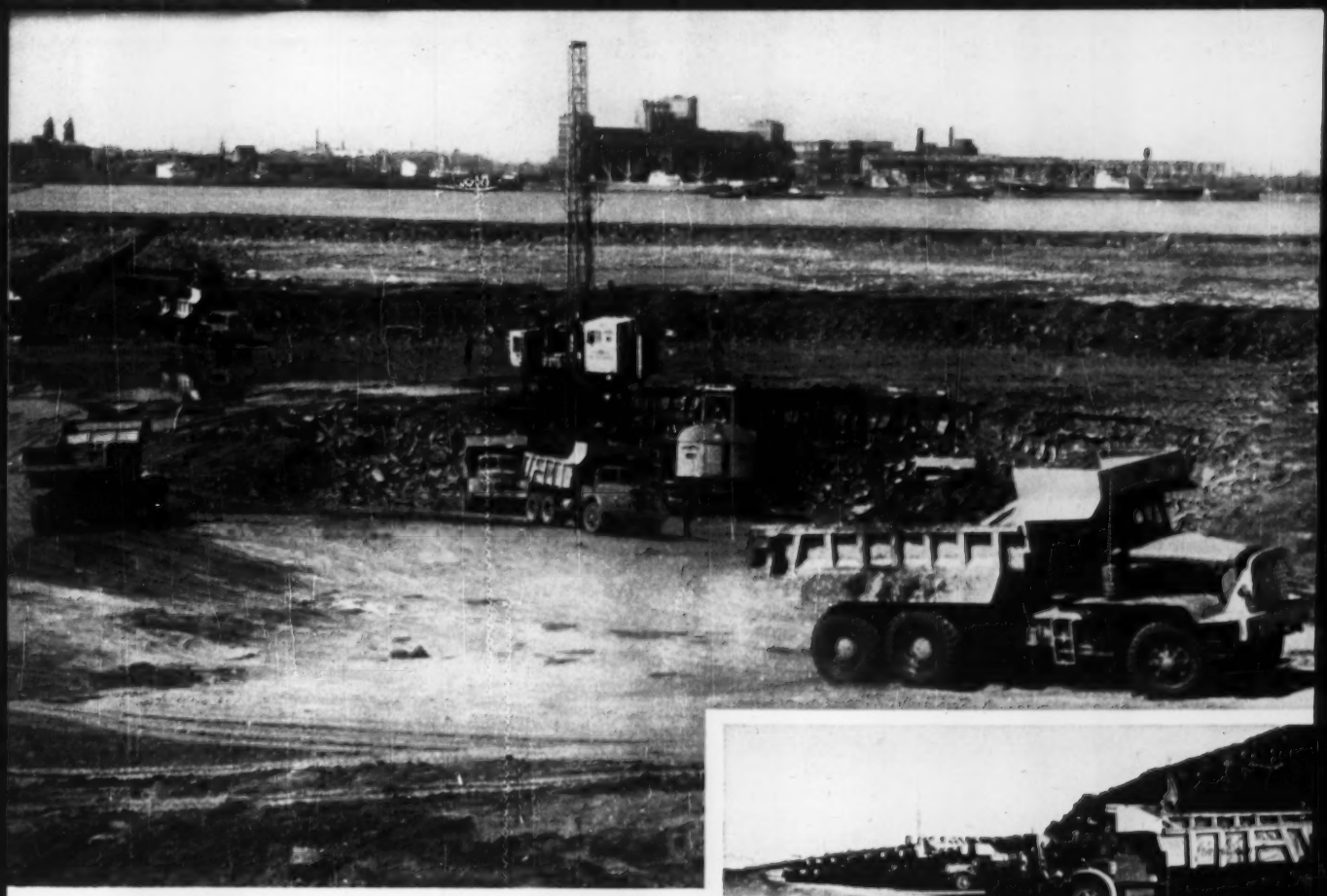
High-output fluorescent lighting inside and outside the hangar provides 30 ft-c 10 ft above the floor. Light from the exterior plastic-covered fixtures is directed far out onto the airfield, illuminating a taxi strip and parking area. A 750-kva transformer station furnishes electricity.

Four deluge sprinkler systems, with a capacity of 6,000 gpm, were installed for fire protection, and 3-ft incombustible curtains were suspended between the systems to help prevent fire from spreading.

The hangar also is equipped with push-button operated high-pressure nozzles for spraying hot water on planes, for de-icing. Each button activates a different spray pattern. The water is drained away through pits with wide bottoms but narrow openings at floor level.

The Ballinger Co., Philadelphia, Pa., was the architect-engineer for the structure. Ammann & Whitney, New York City, were the consulting engineers. The owner, the City of Philadelphia, is constructing the hangar for TWA, with Baton Construction Corp., Philadelphia, as the general contractor and Lehigh Structural Steel Co., Allentown, Pa., as steel fabricator and erector.

Cable-suspended roofs also have been constructed at the Kansas City, Mo., airport (ENR Jan. 26, 1956, p. 44) and New York International Airport (ENR March 1, 1956, p. 42). These, however, project on both sides of a central shop core.



Macks are popular on the St. Lawrence Seaway . . . and for good reasons—their bonus capacities, sure-footed traction, and dependable power pay off. (Right) A Mack lineup ready for work on . . .

The St. Lawrence Seaway . . . a big job for big trucks . . .

. . . a job for a lot of heavy-duty Macks—that's the conclusion of Miron & Freres, Limited, the contractor working on the Cote St. Catherine section of the St. Lawrence Seaway. They are using Mack off-highway dumpers exclusively, over 30 of them, for their big earth-moving job. And their big Macks are paying off for them in real hauling efficiency—plenty of power for big payloads with minimum maintenance costs . . . even during winter operations.

Like these big dumpers, all of Mack's heavy-duty construction chassis for concrete mixers, tractors, and flat bed trucks can be relied upon for outstanding performance. Rugged construction, dependable power, low maintenance, as well as such features as Mack's Balanced Bogie and exclusive Power Divider—the four-wheel tandem drive that delivers power only to the wheels with traction—make Macks the logical choice for getting jobs done on schedule, and at a profit.

For full details, see your Mack Branch or Distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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TRUCKS

Tractor Spins in a Tight Circle

FORWARD drive is torque-converter smooth . . .

SPIN-TURN wastes no time, gets rig . . .

BACK to pick up another payload.

Featuring counter-rotating tracks as one of three new engineering advancements in crawler tractor design, two new heavy-duty models were introduced to the construction industry at the Churubusco, Ind. plant of the American Tractor Corp.—recently merged with the J. I. Case Co.

Both the 80-hp Model 800 and the 100-hp Model 1000 Case-Terramatic crawlers also feature torsion bar suspension and centralized lubrication.

Independent power control of each track, both as to speed and direction, enables the operator to make a tight, fast 360-deg turn, practically within the tractor's length, with one track driving forward and the other in reverse.

The torsion bar track suspension feature permits each track to oscillate freely over irregularities in the ground surface, with the loader bucket or bulldozer blade remaining level. This is achieved by means of torsion bars running the full length of track on each side, with connecting linkage across the chassis to equalize the loads. The torsion bars bear in the exact center of each track frame, so there is no tendency to twist the frames.

A unique two-point centralized system lubricates the lower track wheels. It includes a completely sealed 8-qt reservoir extending the full length of the track frame on each side. It takes about 10 min to lubricate all lower track wheels, says the manufacturer.

Four hydraulic clutches on either side of the center input shaft, give the transmission both high and low speeds, plus forward and reverse on each side. Both machines have four speeds forward up to 6 mph and four reverse speeds up to 7 mph.

In addition, the constant-mest Terramatic transmission enables the operator to change speeds or direction instantly while in motion without touching a master clutch or stopping to shift gears.

All machine movements are controlled by four hydraulic clutch levers, a manual speed-range selector, foot accelerator, and two hydraulic foot brakes.

In addition to the counter rotation feature, the tractors can make smooth power turns by driving one track faster than the other, or a pivot turn by disengaging the clutch and locking the track on one side.

For example, the 80-hp Model 800 crawler can make smooth power turns within an 11-ft track radius, according to the manufacturer. It can also pivot 360 deg within a track radius of 7 ft 6 in., or spin completely around within a radius of 5 ft 7 in.

In addition to this new three-way hydraulic steering feature, a new power-shifting transmission and torque-converter drive are said to give the new 80- and 100-hp crawler a much greater combination of power, speed and ease of maneuverability than is available in any other crawler tractor in their size and price range.

The 80-hp model can develop 20,000 lb of drawbar pull or push, while the 100-hp model is claimed capable of producing a maximum pull of 24,000 lb.

These two big models supplement a line of smaller tractors introduced last year (ENR Sept. 15, 1955, p. 69). They are available with a complete line of matching equipment. This includes: 1½- and 1¾-cu yd tractor-shovels, an angling dozer blade that can be angled hydraulically from the operator's seat, and a straight bulldozer that tips fore and aft, and also tilts sideways—entirely by hydraulic action.

Push-button electric starting and an electric cigarette lighter are included as standard equipment. J. I. Case Co., Racine, Wis.

Card-Tape Converter Made For Electronic Computers

An electronic unit, which converts information from computer punch cards, typed tapes or a keyboard to proportioned resistance or voltage values now is available.

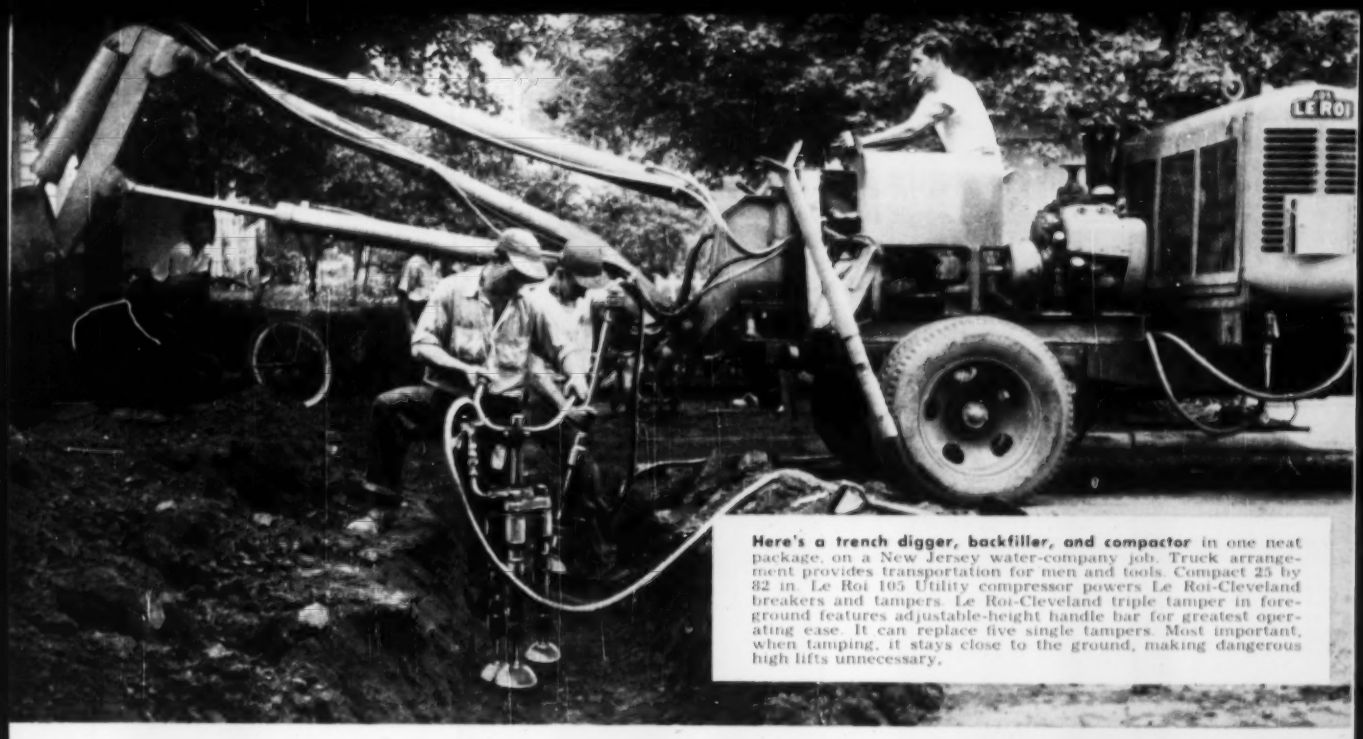
Data is programmed into the converter's memory by a control circuit which insures that only information is read into the memory. Errors due to stray pulses are eliminated.

The unit is for use with an IBM punch, Flexowriter tape or the company's Model 175 keyboard—Electro Instruments, Inc., 3794 Rosecrans St., San Diego, Calif.

Colored Border Brightens Aluminum Front for Store

Colored plastic forms the border of a satin-finish aluminum sash now marketed by Kawneer for store fronts and show windows. Laminated to an aluminum backing, the 1-in. strip of textured vinyl may be inserted or not, as the user chooses. Special notches are provided for the purpose.

Variety is possible, too. The strips are interchangeable and come in three colors: red, yellow and olive. The vinyl



Here's a trench digger, backfiller, and compactor in one neat package, on a New Jersey water-company job. Truck arrangement provides transportation for men and tools. Compact 25 by 82 in. Le Roi 105 Utility compressor powers Le Roi-Cleveland breakers and tampers. Le Roi-Cleveland triple tamper in foreground features adjustable-height handle bar for greatest operating ease. It can replace five single tampers. Most important, when tamping, it stays close to the ground, making dangerous high lifts unnecessary.

Work-Saving Air-Tool Applications

by LE ROI

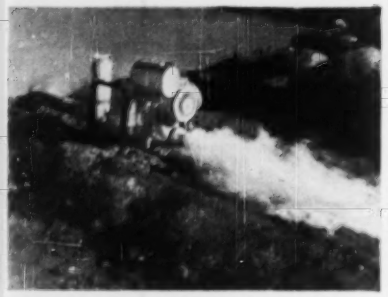
Highway construction in Mexico is frequently for the birds, or literally could be as this picture indicates. Two operators pictured on this treacherous perch rely on easy-handling Le Roi-Cleveland sinkers, as do 38 others on job. To complicate the fatigue problem, this area around Chilpancingo is often subject to extreme heat. Sealed dust-proof feature is one reason why these tools produce the powerful, constant rotation needed for fast drilling.

On this $1,600,000 Cleveland sewer job, Le Roi-Cleveland clay diggers set a daily 20-ft. pace. The C-10 clay spade was chosen because a great deal of handling and lifting were required. Operators appreciated a well-balanced tool for this rush job. The spade also is free from bumps, so that operators can get a firm grip and still work close to tunnel walls.

Gas company employee breaks through tough 12-in. concrete. To speed emergency repair work, this utility chose the maximum shattering impact of a Le Roi-Cleveland 52 paving breaker. Work speed, however, was only one consideration. Low-cost operation was important too. The 52's piston air-cushion reduces internal part wear, makes handling easier.

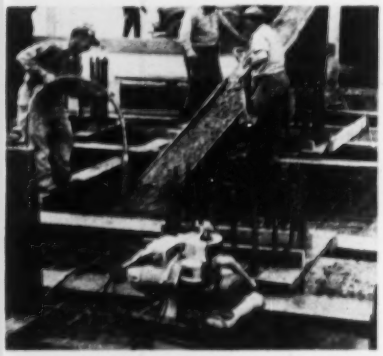
LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

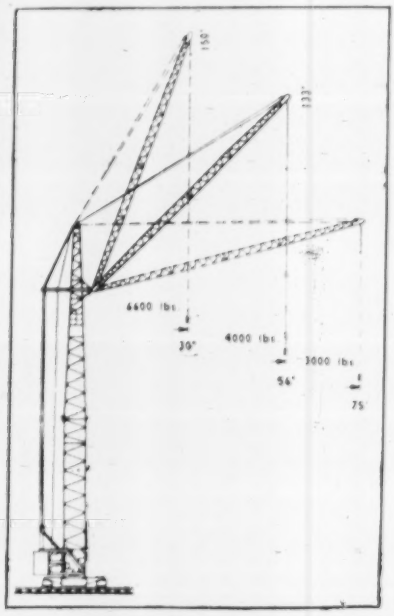
HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

is said to be weatherproof and impervious to ammonia and other window-cleaning agents.

The sash can be adapted to most jamb and sill conditions with one or another of the four available jamb types. Kawneer Co., Niles, Mich.



New Type of Electric Crane Works on Rails at Job Site

A Canadian crane now distributed in the U.S. works on rails at the job site but travels from job to job on rubber-tired wheels. The operator can hoist a load, raise and swing the boom, and roll the rig to a new position all at the same time. Tradename of the crane is Skyway.

In operating position, the crane has a vertical mast like a stiff leg. But there are no guy cables, and the boom is pinned near the top of the mast instead of the bottom. The operator's cab is inside the mast just below the boom. Controls also are located, however, in a conventional cab at the base of the mast. Load and boom cables pass over sheaves at the tip of the mast.

To swing the boom, the operator swivels the base platform. It can be rotated full circle.

The carriage has four trucks with flanged steel wheels for rail operation, and a detachable axle with two rubber-tired wheels on which the crane is towed between jobs.

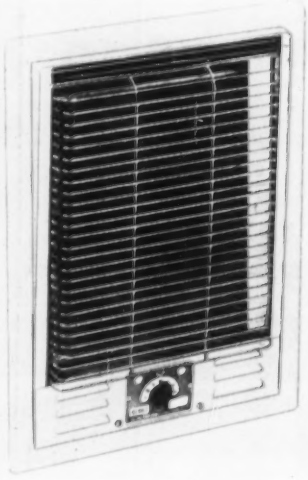
For towing, the boom is lowered until it parallels the mast, and both are then lowered to horizontal position. The mast telescopes to reduce length. After the mast is coupled to the towing tractor, the crane winches its own rear wheels up off the rails, and the towing axle is rolled beneath the carriage and fastened. Finally, the hinged outriggers on which the steel wheels are mounted are swung inward to reduce overall width.

In setting the crane up for operation, the same steps are followed in reverse sequence. Setting up takes 90 minutes, according to the manufacturer.

The crane operates on five 220-v 60-cycle electric motors. A motor-driven drum winds and unwinds the power cable.

Safety cutouts shut off the power if (1) an attempt is made to lift loads heavier than rated capacity; (2) the hoist hook is raised too close to the boom; (3) the boom approaches the vertical position, and (4) the crane nears the end of the track. If the crane loses ballast, the cutout point is automatically adjusted for the lighter capacity.

A wide range of models is available, with maximum hook height up to 275 ft. Timberland Machines, Inc., 169 Front St., South Portland, Maine.



Radiant-Panel Designed For Use in Small Rooms

A recessed-type 750-w heater added to the Berko line of glass radiant panels is said by the manufacturer to concentrate more heat per sq in. of glass than any other unit of equal rating.

With a rated output of 2,560 Btu per hr, the heater is intended for use in small rooms like ticket booths, bathrooms and dressing rooms.

The heater is made in two models: 120 v, 6.25 amp; and 240 v, 3.12 amp. Berko Electric Mfg. Corp., 212-40 Jamaica Ave., Queens Village 28, N. Y.

A Larger Screen

5 x 16-ft three-deck screen fills out company's line

To meet demands for greater production of accurately graded aggregate, a new 5 x 16-ft triple-deck model has been added to round out the Cedarapids line of horizontal vibrating screens. It will be shown for the first time at the 1957 ARBA road show in Chicago.

The new screen, the largest in the line, is designed for high capacity in heavy-duty applications in stationary crushing and screening plants.

The horizontal position of the screen is said to provide as much as 12½% more screening area than an inclined screen of the same length, because the level position of the screen cloth openings permits more material to pass through each opening. Increased capacity as well as more accurate graduation is claimed by the manufacturer.

A steel plate feed box at the feed end of the top deck takes the initial impact of material being fed to prevent damage to the screen cloth, and it spreads material across the full width of the screen. The open discharge end of the unit reportedly prevents jamming of oversize material.

The screen box and screen cloth support frames are heat treated to relieve any stresses that might occur in the weldments.—Iowa Mfg. Co., Cedar Rapids, Iowa.

8,000-Lb Capacity Fork Truck Equipped With Power Brakes

Power brakes, power steering and finger-tip directional control are standard on a new 8,000-lb capacity, pneumatic tire fork-lift truck—the Yardlift 8024.

With four speeds in each direction, the truck will travel 16¼ mph forward and 16 mph reverse and climb a 21% grade loaded.

Water, fuel and hydraulic filler caps are outside the engine for quick access. Major engine components are reached through hinged side louvers covering the engine.

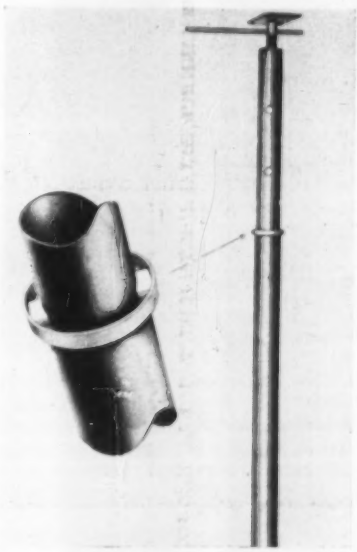
An engine hour meter, ammeter, oil pressure gage, fuel and temperature gages, ignition switch and starter button are all mounted in a panel on the steering column.

A light-action spool-type valve with built-in pressure relief controls the hydraulic system and provides lift speeds of 48 fpm empty and 42 fpm loaded. The axle-mounted telescopic upright tilts 4 deg. forward and 12 deg. backward. An automatic "tilt-lock" valve prevents upright drift.

With a length of 132 in. and width of 77 in., the Yardlift 8024 has a turning radius of 134½ in., wheelbase is 86 in.

The machine is powered by a 6-cyl, 209-cu-in. disp Continental gasoline engine. The axle is a full-floating spiral bevel pinion and ring gear type with wheels connected directly to axle shafts. A 12-in. dia. single disc, dry plate clutch with capacity of 245 lb-ft of torque is controlled by an automotive type foot pedal.

Power assist steering is the continuous follow-up type, operating uniformly throughout the engine speed range. Feel of the load and road is maintained through mechanical linkage, assuring positive control in case the engine stops. Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

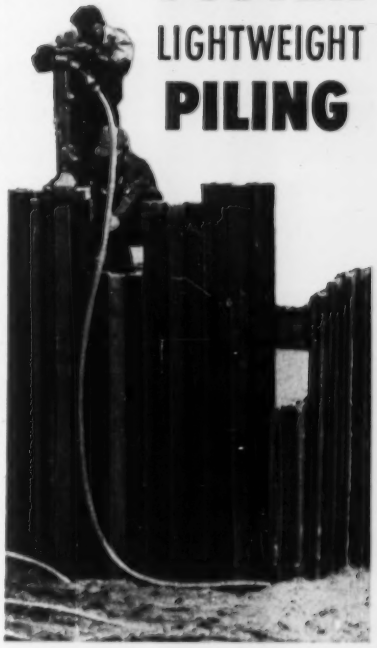


Adjustable Steel Jack Post Will Support a Six-Ton Load

An adjustable jack post for shoring up sagging floors has been added to Gabriel Steel Co.'s line of homebuilding products. The device comprises two telescoping steel tubes with a screw jack assembly at the top.

Coarse adjustment for height is made by raising the upper (inside) tube. Locked at that height with a pin and set in place on its rectangular base, the post is then lengthened by jacking until it applies the desired amount of uplift under the member to be supported. Capacity is 12,500 lb. Gabriel Steel Co., 13700 Sherwood Ave., Detroit 12, Mich.

FOSTER
LIGHTWEIGHT
PILING



New, Lower Cost Protection for Light Excavation!

This is the most economical sheeting available for smaller excavation jobs. Foster Light Weight Piling offers the greatest strength, pound for pound, of any light weight piling made, handles by hand, drives with an airhammer, requires no special rig or tools. Rigid box-type corrugation gives easier driving and recovery, lets you work faster. Special interlock design won't jam, permits the simple locking of sheets together without sliding one into the other the entire length. The new, higher section modulus permits using a lighter gauge, with less bracing—*assures lower costs* on any job. Immediate Deliveries in any length, in any quantity from Foster warehouse stocks — Rental or Sale. Investigate these special advantages . . . get our quotation for your next job.

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Publications

Sewage planning—Using layman's language, along with photographs, drawings and cutaways, an 86-page pamphlet put out by University of Florida's Engineering and Industrial Experiment Station deals with all facets of sewerage planning. This Florida Engineering Series No. 2 should be of particular help to those community officials concerned with the problems of providing and maintaining sewerage and sewage disposal facilities. Among the subjects covered are sewage collection and treatment, financing, how to get the job going and the community's responsibility for operation. Copies may be had for $1.10 each by writing to CAMPUS SHOP AND BOOKSTORE, UNIVERSITY OF FLORIDA, GAINESVILLE, FLA.

Corrosion measurement—The Corrosometer, an instrument that measures electrically the progress of a corrosive system, is described in a 10-page bulletin, plus 13 pages of test results. The meter measures directly the loss of metal due to corrosion without removing the metal from its environment. Readings require about 30 seconds and the probe, or electrical connection to the instrument, can remain in the corrosive system at all times. Measurements are based on the increase in electrical resistance of a metal as corrosion takes place. CREST INSTRUMENT CO., 11808 S. BLOOMFIELD AVE., SANTA FE SPRINGS, CALIF.

Masonry cutters—In a revised 12-page edition of Bay State's "Abrasive Products for the Building Trades," abrasive blades for masonry and concrete saws, and special purpose abrasive wheels are pictured and catalogued. Included is a table of recommended blades for cutting 58 different masonry materials. BAY STATE ABRASIVE PRODUCTS CO., WESTBORO, MASS.

Crane—A new catalog describes the fully air-controlled crawler mounted Loram 50 and is now available from the Thew Shovel Co. The catalog describes and illustrates features incorporated in the "50", long-popular model in the 1-yd class. THEW SHOVEL CO., LORAIN, OHIO.

Prestressed concrete slabs—Precast prestressed double-tee concrete slabs are described, illustrated and specified in an eight-page booklet. Span-load tables are included for 10-in. and 14-in.-deep roof members and 14-in.-deep floor members. LEAP CONCRETE, INC., P. O. BOX 1053, LAKELAND, FLA.

Sewage flocculent—The handling and use of Separan 2610 as a chemical flocculent for industrial wastes and sewage is detailed in a 24-page report of many recent field tests.

The synthetic organic polymer, introduced in 1954, has been used successfully in filtering of digested sludge at municipal plants and in thickeners and settling tanks for metal plating, metal finishing, coal wash water foundry and flue dust wastes. Limited experience is available for its use in primary settling and elutriation tanks in municipal plants. THE DOW CHEMICAL CO., MIDLAND, MICH.

Scaffolding—Scaffolds and ladders for construction, shoring, maintenance and repairs are described and illustrated in a 32-page general catalog just published by Patent Scaffolding Co., Inc. Erection procedure, technical data, uses and typical installations are given for each of the firm's types of built-up, suspended and swinging scaffolds. Wood, aluminum and magnesium ladders, and aluminum scaffolds are included. PATENT SCAFFOLDING CO., INC., 38-21 12TH ST., LONG ISLAND CITY, N. Y.

Insulating firebrick—The relationship between heat losses and the weight of refractory linings is described in some detail in an eight-page bulletin on the use of lightweight insulating firebrick in the manufacture of structural clay products. Results of fuel-economy studies performed on a number of salt-glaze and nonglaze periodic kilns are included. Bull. R-43. REFRACTORY DIV., BABCOCK & WILCOX CO., 161 E. 42D ST., NEW YORK 17, N. Y.

Chlorinizers—A new four page bulletin describes the operation and application advantages of two types of chlorine gas feeders. Construction features, safety features, control and dimensions are fully described. Bulletin 840-N10. BUILDERS-PROVIDENCE, INC., 345 HARRIS AVE., PROVIDENCE, R. I.

Pollution climatology—A four-page brochure gives a brief explanation of the role pollution climatology plays in air pollution control. NORTH AMERICAN WEATHER CONSULTANTS, SANTA BARBARA MUNICIPAL AIRPORT, GOLETA, CALIF.

Steel prefabs—An illustrated 4-page bulletin describes four types of prefabricated steel buildings that span from 5 ft 4 in. to 100 ft. Specifications are included. ARMCO DRAINAGE & METAL PRODUCTS, INC., MIDDLETOWN, OHIO.

The use of Mayari R beams in the seven spans of this bridge resulted in a 40-ton reduction in deadweight. Designed by State of California, with specifications modified by the U. S. Bureau of Public Roads, who contracted and supervised the erection by Carl M. Halvorson, Inc., Portland, Oregon.

They paid 18 pct less freight on these bridge beams

High in the forested Sierras lies the town of Quincy, Calif. The construction of a Federal highway between Quincy and Portola called for a 420-ft, 2-lane steel bridge to span the Greenhorn Creek and the Western Pacific Railroad right-of-way.

The out-of-the-way location of the bridge pointed up the importance of light weight in transporting steelwork to the site. This logically led to the use of Mayari R high-strength, low-alloy steel for the main structural members. With a much higher yield point than carbon steel, Mayari R permits designing in lighter-weight sections, which in this case brought a saving in deadweight of nearly 18 pct, and correspondingly lower freight charges.

An additional benefit in this damp location came from Mayari R's resistance to atmospheric corrosion, which runs 5 to 6 times greater than that of plain carbon steel.

Almost every structural job carries some requirement which Mayari R can help answer. If not corrosion-resistance, then perhaps weldability, heavy load limits, or ability to withstand vibration or impact. Our Catalog 353 contains many examples of applications where these problems were involved — and solved with Mayari R. You can get a copy promptly through the Bethlehem district sales office nearest you.

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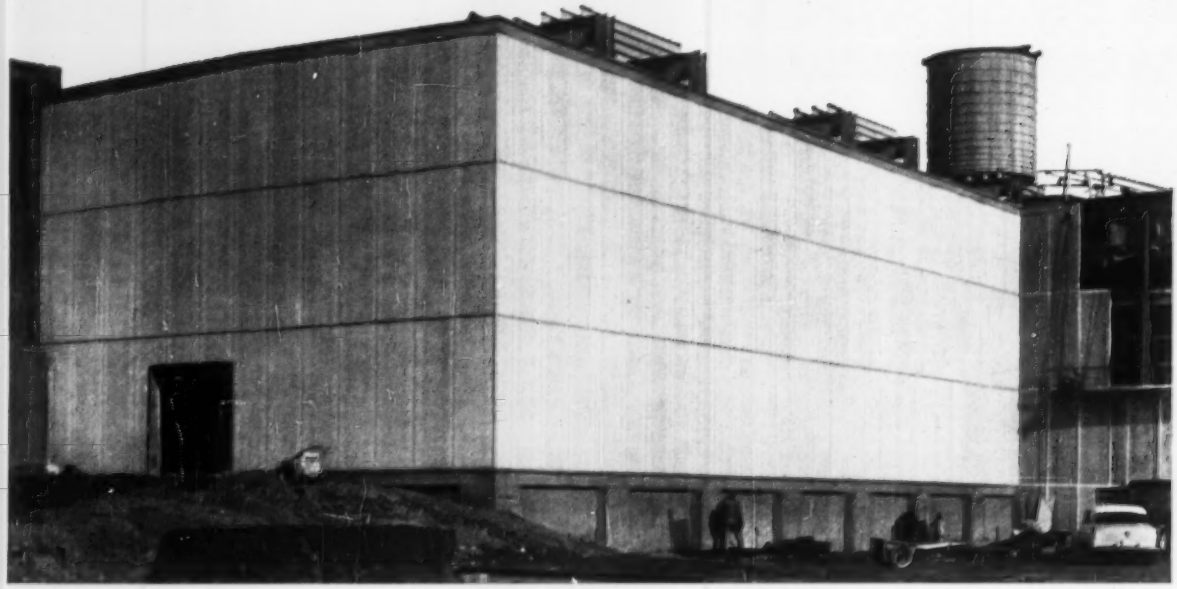

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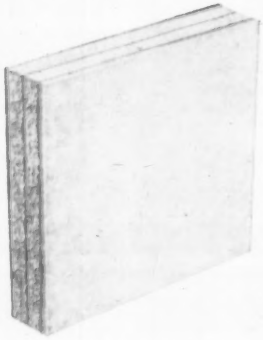
THE MOST striking change in building construction methods in recent years has been the trend toward prefabricated building panels.

This is particularly true in the construction of panelized curtain walls for buildings, large and small. Although curtain wall construction in skyscrapers has been widely publicized, this method of construction is just as applicable to smaller buildings such as schools, hospitals, office buildings, motels and shopping centers. Today, paneled curtain walls probably exceed all other applications in popularity and are rapidly becoming the standard method of building construction.

Johns-Manville Transitop offers architects, designers and builders a simple and economical method of providing panelized curtain walls. Transitop is durable, weather resistant, requires minimum maintenance. As a curtain wall, Transitop provides high structural strength, reduces the dead load, increases usable floor space, provides adequate insulation and is easy to erect. Panels are easily applied over wood or steel framing.

The same advantages that make Transitop so suitable for panelized curtain wall construction also make it equally ideal for roof deck construction.

J-M Transitop is a complete 4′ wide by 8′, 9′, 10′, or 12′ long unit, in $1\frac{5}{16}$″, $1\frac{5}{8}$″, $1\frac{7}{16}$″, or 2″ thicknesses. It consists of an integral impregnated insulating board core faced on two sides with Asbestos Flexboard® sheets.



- Facings of tough, weatherproof asbestos-cement Flexboard
- Core of integrally impregnated insulating board
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- Transitop is cut to fit and installed with ordinary construction tools

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HEADWORK *includes spillway (background) with a navigation lock at its far end and an earth closure dam (foreground) that diverted the river into its new channel.*

Thailand's Greater Chao Phya Project Nears End

Thailand's Greater Chao Phya project at Bangkuang is entering its last construction phases.

When completed next year the project will:

- Provide irrigation for 1.4-million acres of new rice land, which until now have relied on rain water alone.
- Supplement the water supply of 923,000 acres already under irrigation by inundation.
- Improve land and water transportation in the Central Plain area.

The cost for the entire project is estimated at $80 million, with $15 million of that going to a dam, called the Greater Chao Phya Project Headwork. A World Bank loan of $18 million was used to purchase equipment and materials necessary for the job.

Timetable for the project called for construction of the headwork and distribution works to be started in January, 1952; the river to be diverted in January, 1956; concrete work for the headwork to be completed in June,

SPILLWAY *has 16 openings fitted with radial gates to control level of the river and supply canals with irrigation water.*

1956, and the small canals and structures to be finished in 1957.

• **Headwork**—Commonly known as Chao Phya Dam, the headwork comprises an earth dam, a concrete spillway, a navigation lock and a cut-off channel. It is located five miles downstream from Chainat Province on the Chao Phya River.

The Chao Phya Dam is an irrigation headworks, not a storage dam. Its chief purpose is to divert the river flow into feeder canals. To do this, a spillway structure was built in an excavated cut-off at a bend in the river. The old channel was closed by an earth dam to divert the flow through the cut-off channel and over the spillway. The spillway thus is used to regulate the river level so that water will flow into main supply canals. From the main canals, laterals and sub-laterals carry the irrigation water to the rice fields. A navigation lock is at one end of the spillway.

The river level that the spillway must control is lowest at 9 ft (in April) and highest at 35 ft (in October). River discharge in October is 94,000 cfs—well under the 116,000 cfs that the spillway is designed to pass safely.

• **Spillway and lock**—The spillway is 778 ft long and rises 46 ft above the river bottom. The abutments and piers are of reinforced concrete resting on a reinforced concrete foundation slab.

There are 16 openings in the spillway, fitted with radial gates. Four openings were left with lower crests than the others (whose tops are 14 ft above riverbed) for passage of water during diversion of the river.

The navigation lock, founded 13 ft below the riverbed, is 843 ft long; the lock chamber is 46 ft wide. A bascule spans the upper end of the lock.

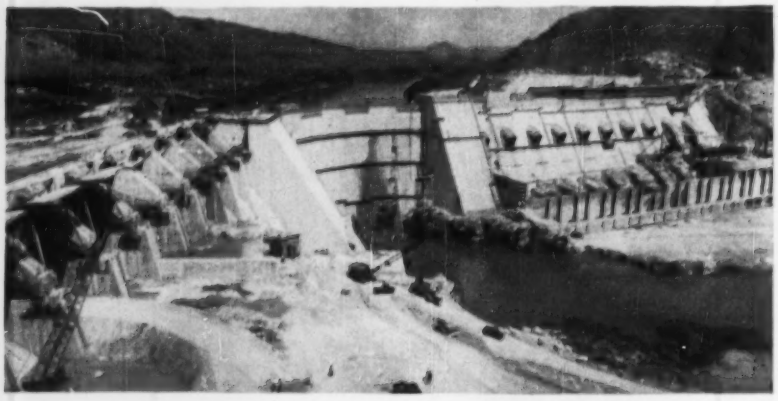
Foundations of the spillway and lock rest on sand strata. There were some clay lenses, but these were removed and replaced with soil-cement. Following tests of samples received, the U.S. Bureau of Reclamation recommended that no foundation piles were needed for the lightweight structures used.

• **Closure**—The cut-off channel was excavated, cutting the bend of the river, to become the new river channel. When the cut-off was ready to receive water, the old channel was closed by the earth dam. The tops of the dam, spillway and lock are all at the same elevation, about 46 ft above river bottom.

The inner zone of the earth dam is of clay, and the outsides are of coarse sand and gravel. Slopes are 1:4. The 33-ft-wide crest serves as a roadway.

Since all the structures of Chao Phya Dam are on permeable foundation (sand), dewatering was a problem. Well-point pumping was decided upon to do the job. In the case of the lock, where excavation went 13 ft down, pumping went on 24 hours a day for a year.

The Royal Irrigation Department of Thailand is the owner and did the building. Two American designers were loaned by the U.S. Bureau of Reclamation to head the design forces.



Peixoto Dam Reaches Final Stages

Brazil's Peixoto Dam—an arch between gravity-sections—is in its final stages of construction (ENR Aug. 2, p. 43). Intake tunnel is blocked off and the reservoir is starting to fill.

The project is running close to schedule, with the first 40,000-kw unit to be in operation before the end of this month and a second 40,000-kw unit to follow in January. The remaining eight units will be added within a few years to bring capacity to 400,000 kw.

Ebasco Services, Inc., is designer and constructor for Ebasco International, the service company for the owner, American & Foreign Power Co.

Russian Hydro Works

British experts report huge jobs, large Francis turbines

British hydro experts returning from a two-week tour through a number of Soviet river works have added significantly to the West's growing knowledge of Russia's water power program.

The most interesting site visited by the group was Lake Sevan, near the Caspian Sea. The level of the lake is to be lowered 100 to 165 ft over a period of 50 years and the water is to drive turbines as it is released. The project also will provide considerable arable land as the lake level is lowered since the sides of the lake are on a very shallow slope. There are to be eight power stations here totaling 600,000 kw. Three plants are operating already and two more are under construction.

In an interview with the technical press last month, the British engineers twice mentioned "300-mw Francis turbine units" operating in a plant at Krasnoyarsk on the Ob River in central Russia. This would mean the turbines were at least 400,000 hp, or more than twice the capacity of the 165,000-hp units at Grand Coulee—now considered the world's largest.

(It is probable that this reported turbine size is in error because: 1. of the unlikelihood of so large a unit; 2. the largest generators the Russians are planning will be capable of but 200,000 kw; 3. the turbine rating was given in electrical measure, and 4. the British heard about, did not see, Krasnoyarsk.)

In construction—the British noticed an unusual dam facing employing .32-in. stainless steel (about 0 gage) backed by 6 in. of concrete at Khramskaya on the Kura River. No reason was given for this use of stainless steel. At Kakhovka on the Dnieper River a facing of 3-in.-thick precast concrete slabs keyed into place was used.

Corrugated reinforcing bars 3½ in. in dia were observed being fusion welded together. The British were informed that during mass concreting in the winter the Russians heat aggregate and water to about 80 F before mixing.

• **Impressions**—The British hydro team got the general impression that the general impression that the Soviets were rather size conscious in their hydro work, seeming to prefer a larger unit where several smaller units may have been equally suitable. Examples are at Kuibyshev and Stalingrad on the Volga River where 2.1 and 2.3 million kw soon will be completely installed, in the form of 105,000-kw sets, and at Bratsk hydro

station recently begun on the Angara River in Siberia where 3.6 million kw eventually will be installed in 200,000-kw sets (ENR, Oct. 11, p. 27).

Excavation and earthwork also were being carried out on a large scale; at Stalingrad the British were given an earthwork figure of 185 million cu yd. If true, this would make Stalingrad the largest dam in the world (present record holder: Fort Peck on the Missouri River with 126 million cu yd). A 25-cu yd dragline bucket was seen in operation.

The British hydro group returned with additional confirmation of the Russian tendency toward inattention to detail. Concrete occasionally was so honeycombed that plastering was required. Nevertheless, in power station buildings where impressive appearance obviously was desired, marble floor and elaborate tiling were often observed.

The Russians were proud of the degree of mechanization they had in construction, pointing to one hydro project where it was claimed that 15 kw of power was available per worker.

The overall impression of the Russian hydro effort was one of high competence, in research, design and construction.

Paraguay Awards Contract For Modern Water System

Paraguay has approved the contract between Corporacion de Obras Sanitarias (a Paraguayan government corporation) and Kaiser Engineers International, Inc., for construction of the first completely modern water supply and distribution system for the capital city of Asuncion (ENR, July 19, p. 60).

The project includes four pumping plants, a water treatment plant, three reservoirs and a water distribution system for the city of 250,000.

An Export-Import Bank loan of about $7 million plus an additional $2 million provided by Paraguay will finance the project.

Construction is to begin this month and completion is scheduled for the end of 1958.

Venezuela's Bocono Project Gets Corps of Engineer Men

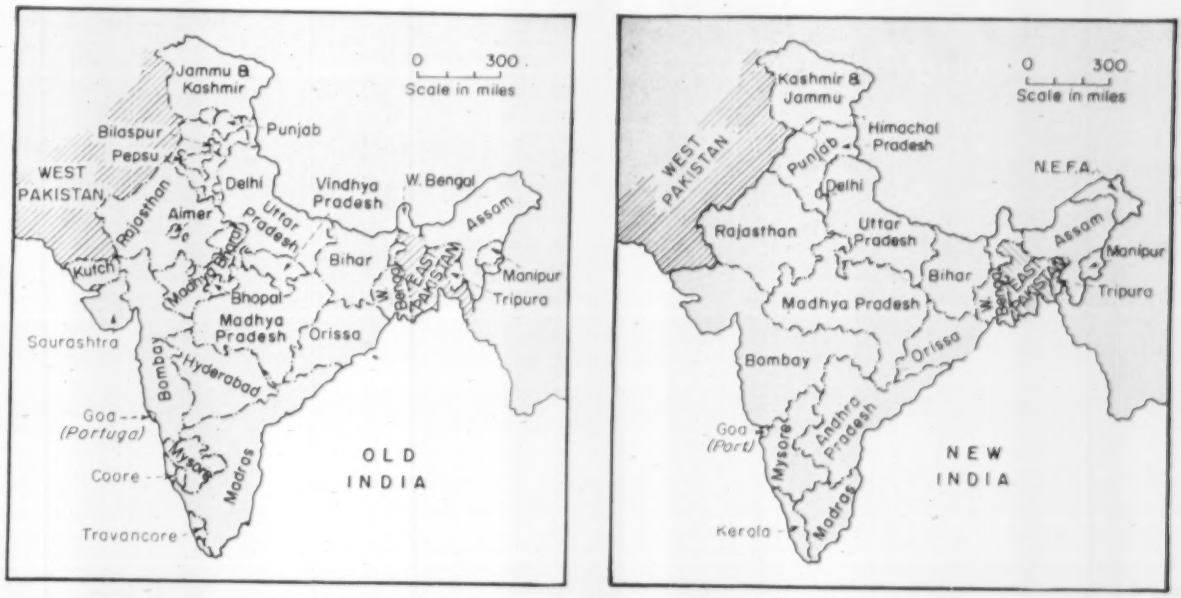
American personnel are being recruited for Venezuela's $70-million Bocono Dam project.

R. J. Tipton Associated Engineers of Denver is designing the project and furnishing technical supervision of construction for Venezuela.

Chief engineer for the Bocono project is Woodrow Burgess, who resigned in September of this year from the Corps of Engineers to join the Tipton firm in South America. Adam J. Hememan, concrete engineer for the job, left the Portland District, Corps of Engineers, last month to go to Venezuela. Other former Corps men with Tipton are Jeff Bover, office engineer, and Sam Sargent, foundation engineer.

The dam, to go up on a south slope of the Andes Mountains in Venezuela, will be a concrete irrigation structure.

Clearing already has started for the 400-ft high structure, which will be the country's first large concrete dam.



India Simplifies Its Map and Government

Many things, particularly river development, will be simplified for the Republic of India by the rearrangement of its state boundaries, which officially went into effect in November.

Some old states disappear completely—Hyberabad, Vindhya Pradesh and Madhya Bharat, for example. One new state, Madhya Pradesh, is created. West Bengal is changed from two separated areas into a single piece. All of the small princely states disappear, along with their maharajahs, who, however, in a few cases—notably in Mysor—continue as governors. And the Punjab is divided into a Hindi-speaking section and a Sikh-speaking region.

Dividing the country according to linguistic regions is the basic theory of the new arrangement. Better cooperation between the state governments and the people they govern is counted on to improve local administration. The fact that there will be only half as many state legislatures as before has a similar advantage on the national scale. Public works can be carried out more effectively and, in particular, there should be fewer disputes over the division of river waters for irrigation, power and water supply.

G. K. Leonard

He steps up . . .

C. E. Blee

. . . as he steps out

A New Chief Engineer for TVA

The Tennessee Valley Authority gets a new chief engineer on Jan. 1. He is George K. Leonard, who will take over administrative responsibility for planning, design and construction of all dams, hydroelectric power plants, navigation facilities, steam-electric power plants and other related features of the multipurpose TVA system. Leonard replaces Clarence E. Blee, who steps out after 21 years with TVA, the last 13 as chief engineer (ENR, July 24, 1952, p. 57).

George Leonard is well prepared to head the Office of Chief Engineer for the organization that has produced a showcase of river development known the world over. He comes to his new post following a long history of association with TVA—a career that started in 1933 shortly after passage of the TVA Act.

Leonard moved up from job to job until, in 1950, he reached the one he now vacates—chief construction engineer, heading the division of construction. This is one of three main divisions of the office of chief engineer; the other two are planning and design.

• **A steady climb**—After receiving his B.S. in civil engineering from the University of Nebraska in 1912 (he also has a C.E. degree from the same school), Leonard worked with the Nebraska state engineer and ended as assistant state engineer. In 1921, he joined Woods Brothers Construction Co., becoming general superintendent in charge of heavy construction by 1925.

In 1933 Leonard went to TVA, establishing a tenure that, to date, has lasted 23 years.

In that first year of TVA's existence Leonard was made assistant construction engineer on Wheeler Dam. In 1937 he became construction engineer on Guntersville Dam, and later on Watts Bar and Cherokee.

Next step was Leonard's appointment as project manager for the Apalachia, Ocoee No. 3, Nottely and Chatuge dams (of the Hiwassee Projects authorized by Congress in July, 1941). Under his supervision the dams were constructed and in operation in a little over two years. One of the highlights of this job was excavating in 11 months a 20-ft-dia, 5-mi-long tunnel for the Apalachia project.

Upon completion of this work Leonard became head of the TVA project planning division. This was followed, in 1946, by his appointment as project manager for the Watauga, South Holston, Boone and Fort Patrick Henry dams, which were being built for flood control and power on the upper tributaries of the Tennessee River. Also, in 1949, TVA began a number of steam plants starting with the Johnsonville station.

In 1950, with Watauga and South Holston dams finished, Leonard became head of the division of construction.

During his six years as chief construction engineer, Leonard has seen Boone and Fort Patrick Henry dams and hydroelectric plants finished; 14 additional units installed in 10 existing dams; steam plants at Johnsonville, Widows Creek, Kingston, Colbert, Shawnee, John Sevier and Gallatin placed in operation.

Leonard now goes to chief engineer of TVA—a key spot in a system that, at this time, boasts an installed generating capacity of some 10 million kw.

• **The man he replaces**—TVA's present 10-million-kw capacity grew from 2 million in 1943. Those were the 13 years during which Clarence Blee, the man Leonard replaces, served as chief engineer. Before that, Blee, who joined TVA in 1935, was project manager in charge of construction of the Hiwassee, Fort Loudoun and Fontana projects.

Blee's pre-TVA record includes—after receiving his B.S. in civil engineering from Stanford University in 1911—four years in British Columbia on hydroelectric and water-supply construction. In 1923, after a year as assistant professor of civil engineering at Stanford, he took charge of design and construction of a number of hydroelectric projects for British Columbia Power Corp., Ltd. He remained with the company until joining TVA.

Blee, who is now on a vacation trip to Africa, expects to engage in consulting practice when he returns. He is on the executive committee of the U. S. Committee on Large Dams, the board of consulting engineers of the St. Lawrence Seaway Development Corp., and the board of consultants for Priest Rapids Dam.

Consulting Office Is Opened By Retired Parsons Partner

Lawrence S. Waterbury, recently retired partner of Parsons, Brinckerhoff, Hall & Macdonald, has opened a consulting engineering office in New York.

Waterbury developed financial reports on more than $2 billion worth of highways, causeways, bridges, tunnels and other projects while with PBH&M. He continues to serve the firm as a consultant.

A practicing engineer for nearly 40 years, Waterbury joined Parsons, Brinckerhoff as an associate engineer in 1937 and became a partner in 1947.

Obituaries

Abraham N. Goldberg, 62, founder of the general contracting firm of A. N. Goldberg, Inc., died in New Orleans Dec. 4. He was a graduate of Tulane University and had served with the Army Corps of Engineers during World War I.

John L. Porter, 78, Louisiana sanitary engineer, died Dec. 4 in New Orleans. His state service included 30 years with the New Orleans Sewerage and Water Board, and assignments with the U. S. Public Health Service's bureau of sanitary engineering and the engineering division of the Louisiana State Board of Health. He graduated from Massachusetts Institute of Technology in 1900.

John A. Young, 61, civil and mechanical engineer in charge of mechanical construction and maintenance for the variety store chain of H. L. Green Co., Inc., New York, died Dec. 10 in New York. Before joining the Green Co. in 1950, he had been engaged for 23 years in construction and maintenance of the stores of D. A. Schulte, Inc. An alumnus of Cooper Union, in New York, Young was licensed in 1917 as a professional engineer. For the next 10 years he worked in New York for the Erie Railroad.

Alexander D. Stark, 73, a consulting engineer with the New York City firm of Singmaster & Breyer, Inc., died Dec. 16 in Milford, Conn. A naval architect as well as a civil engineer, Stark had a hand in the design of the United States Lines' luxury liner, the America.

M. Grant Blakeslee, 67, president of Blakeslee & Sons, New Haven, Conn., contracting firm, died Dec. 9. A native of New Haven, Blakeslee, a 1912 graduate of Yale Sheffield Scientific School, has been with his family's company since leaving college. He also was president of the Seymour (Conn.) Water Co., secretary of Waverly Construction Co., and president of Blakeslee Estates, a development firm.

Maxwell W. Fisher, 50, engineer of maintenance for the Wisconsin State Highway Commission, died Nov. 24. Fisher, a 1927 graduate of Denison University with a B. S. degree in Mathematics, obtained his B. S. degree in Civil Engineering from the University of Wisconsin in 1928. He joined the highway commission as Chief of Party in 1928 and in 1950, after a series of promotions, achieved the state's top position in maintenance.

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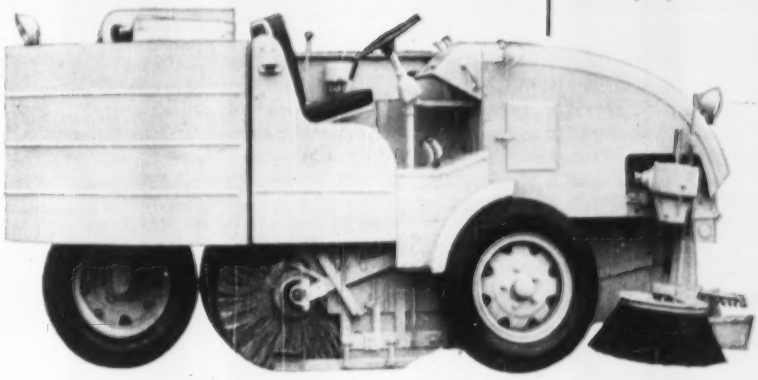

A number of Blood Brothers Universals are used on this Municipal Supply Co. Street Sweeper.

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For instance, to help protect your profits against delays and repair bills, they all provide extra-rugged, dependable Blood Brothers Universal Joints.

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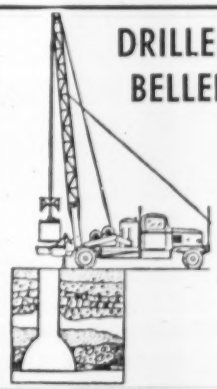

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The facts were these: Frankini Construction Co., as prime contractor, entered into a contract with Medford Housing Authority for construction of a housing project and then sublet some of the work to C. C. Smith Co. The subcontract provided that progress payments were to be made monthly within 10 days after receipt by Frankini of payments for the part of the work done by Smith.

Smith substantially performed the work called for by its contract. The total amount to be paid for the work under the subcontract was $7,500, and the fair value of the labor and material needed to complete the subcontract was $156. The authority had made progress payments to Frankini on account of the work done by Smith in the amount of $6,547.28, but Frankini had paid Smith only $3,000. Smith then notified Frankini that it would not complete the work unless it was paid the amount then due it.

Several month later, the authority declared Frankini to be in default on the general contract and notified Frankini that it was terminating the contract. Reasons assigned for the termination were (1) repeated failure to supply enough properly skilled workmen; (2) failure to make prompt payments to subcontractors; (3) persistent disregard of instructions of the authority and the architect, and (4) failure to perform the provisions of the contract. Under the terms of the general contract, a failure on the part of the contractor with respect to any of the foregoing matters gave the authority the right to terminate the contract. Frankini performed no work thereafter nor did Smith ever complete the work which remained unfinished. When Smith learned that the authority had cancelled the contract, it filed with the city clerk of Medford a sworn statement of its claim, which was sufficient as to both form and content.

The subcontractor then instituted a proceeding against the prime contractor and its surety to recover the balance due for work it had already performed. The trial court granted judgment against the prime contractor but dismissed the action against the surety. The dismissal was based on a local statute which provided that in order to get the benefit of such security, claimant must file a claim within 60 days after claimant ceases to perform labor or furnish labor, materials, or appliances or equipment.

The appellate court[1] reversed this judgment and directed that judgment be entered against the housing authority, which was made a party to the action, such payment to be limited to the amount of money retained from that owing the prime contractor and against the surety for the balance. The court held that where the subcontractor was not in default, but the prime contractor was in arrears in making payment to the subcontractor, the subcontractor was justified in withholding further performance. Under the above circumstances, the appellate court held that where the housing authority had terminated the general contract while the subcontractor had not been paid in full, the subcontractor could recover from the authority and the contractor's surety if he filed his claim within 60 days after the general contract was terminated.

(1) C. C. Smith Co. v. Frankini Const. Co., et al., 135 N.E. 2d 924, Supreme Judicial Court of Mass., June 29, 1956.

No Recovery for Extra Cost Of Substitute Materials

A contractor who substitutes more expensive material than that called for by the contract cannot recover for the extra cost in the absence of an agreement to reimburse him for it.

In a Navy contract, for example, one of the items covered in the bid was telephone cable, either paper wrapped or latex covered. The Navy decided to use the paper-wrapped cable. The general contract was awarded to Ahearn Electric Company. Before submitting his bid, he obtained from Westinghouse Electric Supply Co., a price for the paper-wrapped cable.

After being awarded the general contract, Ahearn placed an order with Westinghouse for the cable which was accepted. During the progress of the work, it became apparent that Westinghouse would not be able to deliver the paper-wrapped cable in time to permit the prime contractor to complete the job within the time stipulated in the contract and that the prime contractor would be penalized for liquidated damages for delayed performance. The salesman employed by Westinghouse told Ahearn that they could furnish latex-covered cable in time to finish the work in the time stipulated.

Ahearn asked the Navy for instructions and for a better price if latex-covered cable was installed. The Navy responded that the specifications had been amended in this respect, but no increase in price was suggested. The salesman that had obtained the original order for the paper-wrapped cable forwarded to his employer an order for latex-covered cable, which order was not signed by Ahearn.

Ahearn paid Westinghouse the price of the paper-wrapped cable in accordance with his original order. Westinghouse then brought an action against Ahearn to recover the difference between the price of the paper-wrapped cable and that of the latex-covered cable. Ahearn received no extra compensation from the government for the use of the more expensive cable. The trial court denied Westinghouse a recovery and the judgment was affirmed on appeal.[1]

The court held that the evidence produced at the trial showed that the only contract between the parties was to furnish the paper-wrapped cable at a fixed price and that this type of cable was to be delivered in time to permit the prime contractor to complete the work within the stipulated time. Ahearn at no time agreed to pay more than what he had originally agreed to pay for the cable.

Said the appellate court: "The terms of the express contract control. There cannot be an implied contract either in law or in fact contrary in terms to a controlling express contract. If Westinghouse had furnished the paper-wrapped cable and proved that it cost $7500.00 or that the expense of obtaining the cable at the time was a similar figure, still it would be bound to deliver at the agreed figure of $1800. The fact that latex-covered cable was substituted made no difference.

"In the parallel situation, the Navy received the benefit of the more costly material and might be conceived to be unjustly enriched thereby. But the contract between Ahearn and the Navy was controlling even if he installed material which he had not contracted to deliver."

(1) United States etc. v. Ahearn, 231 F. 2d 353, U. S. Court of Appeals, Ninth Circuit, (Wash.) Oct. 26, 1955.

Proof of Use of Materials In Foreclosure of Liens

In foreclosing a mechanic's lien for materials furnished a contractor, it must be shown that the materials were used on the property to which the lien attaches.

In an Ohio case, for example, a materialman brought an action against the owner of certain property to foreclose a mechanic's lien for materials furnished the contractor who performed a repair job on the property. The materialman obtained a judgment in the trial court, but this judgment was reversed on appeal, the appellate court[1] holding that the evidence produced at the trial did not establish that the materials that were furnished to the contractor were used on the job in question.

After referring to several cases, the court stated: "In view of the foregoing decisions, it is concluded that in a materialman's lien, the petition must allege, and the evidence must show, that the materials were furnished by virtue of a contract, expressed or implied, between the contractor and the owner."

The appellate court found it to be a fact that in this particular case the materialman had not complied with these conditions.

(1) Seybold v. Pitz, 136 N.E. 2d 666, Court of Appeals of Ohio, Dec. 22, 1955.

Acceptance of a Deed As Waiver of Defects

"Where a contract for the sale of a parcel of land calls for the construction of a house thereon in accordance with plans and specifications, the mere fact that the purchaser takes possession does not necessarily constitute a waiver of defects or an acceptance of the contractor's workmanship. The law will not raise a presumption that the right of the purchasers to damages for defects in the work of construction has been discharged by their acceptance of the property unless there has elapsed an unreasonable length of time without any complaint by the purchasers. However, where defects in the work of construction of a building are known or readily discoverable by the purchasers of the property, and no complaint about the quality of the work is promptly made by them, their acceptance of the property discharges any right to damages which they might have had for the defects."[1]

(1) Kandalls v. Paul Pet Const. Co., 123 A. 2d 345, Court of Appeals of Maryland, June 15, 956.

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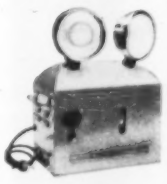

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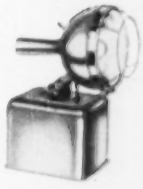

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Books

How to Get Schools Built

SCHOOL PLANNING AND BUILDING HANDBOOK—By N. L. Engelhardt, N. L. Engelhardt, Jr., and Stanton Leggett, 626 pp. F. W. Dodge Corp., New York 18, N. Y. $12.75.

Here is a book that designers and builders not only should read themselves but should encourage prospective clients on school boards to study. Written by members of an outstanding firm of educational consultants, it provides detailed information on the procedures involved in getting a school built.

In its 40 chapters, the book also covers such related subjects as responsibilities of the board, superintendent and professional experts; public relations; budget and accounting for school building programs; legal services and naming the school, cornerstone laying and dedication. It presents, in addition, numerous checklists and ample forms.

Chapters are devoted to each of the major steps in planning a school: school building survey, specifications, site selection, contracts with architects and engineers, drawings and scale models. Considerable attention also is given the construction phases: cost estimates, subsurface explorations of the site, construction contracts, bidding, construction supervision, insurance and surety bonds. Furthermore, helpful information is included on financing.

Land Without Water

THE FUTURE OF ARID LANDS—Edited by Gilbert F. White, 453 pp. The American Association for the Advancement of Science, 1515 Massachusetts Ave., N. W., Washington 5, D. C. $6.75 or $5.75 to AAAS members.

This volume is a compilation of papers and recommendations from the international arid lands meetings, held in New Mexico in the spring of 1955. Authors of included chapters represent 17 nations and about as many different disciplines.

Most of the authors speak for nations sharing the one-third of the earth's surface said to be arid. In their symposium, subjects ranged widely. This book groups them under water supply; better use of present resources (including a chapter on water resources, by L. N. McClellan of the U. S. Bureau of Reclamation); prospects of additional sources, (including a chapter on demineralization by Sheppard T. Powell, Baltimore consulting engineer); and adaptation of plants and animals to arid conditions.

Recommendations formulated as a result of the symposium and published as the final chapter of this volume stress the need for improved estimation of groundwater reserves, improved groundwater recharge practice and demineralization of salt water.

In general, throughout the text there is a calling for cooperative interchange of knowledge among the various disciplines interested in aspects of the arid land problem. A team approach is suggested.

Plastic Design of Concrete

THE ULTIMATE-LOAD THEORY APPLIED TO THE DESIGN OF REINFORCED AND PRESTRESSED CONCRETE FRAMES—By A. L. L. Baker. 91 pp. Concrete Publications Ltd., 14 Dartmouth St., London, S.W.1. 8s

The theory presented in this book goes farther than the ultimate-load design conceptions incorporated in the latest revision of the American Concrete Institute code.

That code takes into account only the reserve strength in the cross section of a concrete beam because of plastic flow. The more general theory outlined by Prof. Baker takes into account in addition the effect of plastic hinges in continuous structures.

The theory has as its objective, computation of the ultimate load—the load or combination of loads that causes failure by instability of the whole structure or rupture of a part, or causes weakening or excessive deformation, so that the structure is of no further use. To this, a safety factor is applied to determine the working load.

Prof. Baker presents a method for determining safety factors based on a "weighted" assessment of conditions. U. S. engineers may not agree with the actual applications Prof. Baker makes of this method, but they should find the principle worthy of consideration. In particular, they probably will distinguish between dead, live and wind loads to a greater extent than the author does in evaluating a safety factor.

The theory of plastic hinges assumes that as loads are increased on a continuous structure, bending stresses at one or more points become so large that beyond a certain load, resistance to rotation there becomes negligible. The ultimate load is the one causing formation of just enough hinges to make the structure unstable. Prof. Baker shows in this book how the theory can be applied to multistory rigid frames.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Wage Rates, Building Board, Lath, Insulation: Last, Nov 29; Next Jan 3 '57
- Cement, Aggregate, Ready-mixed Concrete, Asphalt: Last, Dec 6; Next, Jan 10 '57
- Iron and Steel Products, Pipe: Last, Dec 13; Next, Jan 17 '57
- Wood Products, Glass, Explosives: Last, Dec 20; Next, Jan 24 '57

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$148.25p	$148.25p	$296.50p	$333.55p			$30.50p	$32.70p	$23.50	$24.50	$ .....
Baltimore	203.00	217.00	406.00	485.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00qf	38.00qg	33.35	22.30	28.33
Boston	210.80†	224.60†	421.10†	467.80†	.....	.....	40.00p	44.00p	35.70†	30.00†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.20o	.....
Cincinnati	205.00y	225.00y	296.00ydd	213.00y	288.00y	314.00y	45.00y	46.00y	28.50y	24.25z	28.50y
Cleveland	202.50	215.00	.....	.....	.....	.....	40.00	44.00	31.00	26.00	.....
Dallas	.....	152.00	.....	.....	.....	.....	25.75	45.00	37.86	25.08	.....
Denver	.....	.....	.....	.....	.....	.....	36.00	47.50	34.80bb	28.00bb	34.00bb
Detroit	213.00	226.00	425.00	.....	620.00	710.00	44.50cc	44.00cc	36.00	32.00	.....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	33.00	33.00	32.00	27.50	28.50
Los Angeles	r	r	r	r	r	r	30.50‖		34.00	34.00	38.00
Minneapolis	188.00p	210.00p	429.00p	210.00pw	.....	.....	43.00*p	52.50xi	44.50bbe	35.50bbe	47.50bbdu
Montreal	170.00aq	178.00au	325.00au	270.00	400.00	.....	42.00	49.00	39.00	22.00	13.75u
New Orleans	186.00	186.00	380.00	380.00	.....	.....	40.00	55.00	44.00	32.00	32.00
New York	158.10A	168.60A	231.70eA	233.90An	.....	.....	44.00		37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	.....	.....	30/34	34/40	27.60	25.60	3.17
Pittsburgh	154.00	162.00	292.00	340.00	420.00	495.00	.....	.....	.....	.....	.....
St. Louis	178.50cc	203.00cc	358.00cc	500.00cc	.....	.....	43.00al	41.50a	0.95aaa	80aaa	1.30aa
San Francisco	156.85*	177.10*	235.30dd*	.....	.....	.....	42.50*	42.50*	27.75	27.75	30.50
Seattle	225.00cc	250.00cc	450.00cc	250.00ccw	.....	.....	43.00a	55.00a	48.00aAA	38.25AA	3.90aAA
Toronto	138.70	148.90	273.75	222.00f	.....	.....	25.00	63.00	36.00	33.50	31.00

*† F.o.b. yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 In.-3 cell. *d Pulverized hot. *e 5% 10th following month. *f 8 x 8 x 12. *g 8½ x 8 x 12. *h F.o.b. trucks, lob site N.Y.C. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. *n 7¾ x 7¾ x 12. Speed tile. *o mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used because of earthquake danger. *s 2% discount for cash. *t 5½ x 8 x 11½. *u Tax exempt. *v Sand lime. *w 5 x 5 x 12. *y Stacked. *z Pebble lime price per 80 lb. sack. *aa Price per sack. Lime not sold per ton. *bb LCL. *cc Truck delivery. *dd 8 x 12 x 12. *ee Pebble lime. *ff 80% common. *gg Rough. $40.00 Smooth. *hh fct. *ii Chi common. § F.o.b. yard. *** F.o.b. plant Stockton

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Atlanta	$19.25	$28.275	$3.59	$3.85	$3.31	$3.15	$2.95	$2.95	$0.63	$57.75
Baltimore	19.00	27.90	2.75	4.25	3.35	2.78	4.25	4.25	.48	50.18
Birmingham	19.25	28.275	3.90	3.40	.....	3.37	2.80xi	2.80xi	.87ff	42.65ee
Boston	19.00	27.90	.....	.....	.....	3.30g q	2.85aq	2.85aq	.45g	65.00g
Chicago	19.00	27.90	.....	.....	.....	3.57‡u	3.00‡o	3.00‡o	43.80‡bbe	55.70‡
Cincinnati	19.00	27.90	.....	.....	.....	3.15	2.63	2.63	.594y	52.38
Cleveland	19.00	27.90	2.4228pgg	2.6112gg	2.8237gg	3.15e	2.62a	2.62a	.464y	47.00AA
Dallas	19.25	28.65	.....	3.13ff	.....	3.00p	3.00a	3.00a	.464	65.00AA
Denver	19.50	28.40	3.29	5.15	3.04	2.84	2.30a	2.30a	.48ff	45.00
Detroit	19.00	27.90	3.35	3.25	2.50	2.656	2.409	2.409	.53	47.30
Kansas City	19.00	28.65	3.82	3.25	2.90	3.65xi	3.49a	3.49a	.58y	53.70
Los Angeles	19.00	28.15	3.30n	4.50n	4.20n	3.20n	2.15en	f	70ay	f
Minneapolis	19.00	29.88/28.02	.....	.....	.....	2.835dd	2.358xidd	2.358xidd	.49idd	48.00y
Montreal	.....	21.95	5.02Dff	5.94Rff	4.65Fff	5.25f	4.65f	4.65f	1.60	.....
New Orleans	.....	.....	.....	.....	.....	3.15	2.62	2.62	0.75A	.....
New York	19.00	27.90	.....	.....	.....	2.74G	2.29Ga	2.38Ga	.499Ga	48.00*
Philadelphia	19.00	27.90	3.60	3.40/3.65	3.50/4.60	2.54	2.94	2.94	.37	26.00
Pittsburgh	19.00	27.90	3.10	3.36	3.68	3.72	2.85a	2.85a	.42	58.75
St. Louis	19.00	27.90	.....	.....	.....	2.86a	2.36A	2.36A	.46y	54.35
San Francisco	19.00	28.15	2.95	4.15	3.40	2.70	1.85**	2.84aa	.56	54.00
Seattle	19.00	28.40	3.47mee	4.19mee	.....	3.84mqee	3.33kmee	.....	.85mee	47.20**
Toronto	.....	.....	.....	.....	.....	4.45	4.10e	4.65a	1.70y	88.00A

*‡ Delivered. * Note: Red lead in oil 50¢ higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices; Minneapolis and vicinity. *j 45 gal containers. *k Per cwt. *l Not used. *m 1% discount for cash. *n F.o.b. city. *o Per 60-lb. roll. *p 6-drum, 50 gal. ea. *q Per 90-lb. roll. *r F.o.b. factory, Chicago. *s Truckload. *t Federal tax included; add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. *x Mineral surfaced. *y 55-gallon container *z Drums. *aa 15 lb., 324 sq ft roll. *bb Roofers coating and cement; Price per ton *cc LCL, truck delivery. *dd 2% cash discount. *ee Asphalt pitch in 100 lb. package *ff 5-gal. drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *A 400 lb barrels *B ASTM Spec. D-962-49. *D Std. Black. *E Ready-mixed. *F Over 80% ferric oxide. ** Aver. wt. approx. 425 to 550 lbs. drums. *G F.o.b. factory points

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	PLASTER† Neat per ton	Gauging per ton	VERMICULITE† Home Insulation pellets per bag of 4 cu ft	Plaster aggregate	Concrete Aggregate Untreated	PERLITE Plaster Aggregate	Concrete Aggregate Untreated†	ALUMINUM SHEET‡ Flat, .102" th 36"x96" & 48"x144" per lbr	Corr roof .032" th 35"x12" per sh‡	STAINLESS STEEL SHEET*-TYPE 302§ 20 ga 48"x96 120" per cwt‡‡	28 ga 36"x120" per cwt‡‡	COPPER WATER TUBING-TYPE L 2000 ft lots per ft‡ ¾"‡	1"‡
Atlanta	$30.00	$36.00	$1.55x	$1.65x	$1.80xl	$1.40	$1.40	$0.422m	$6.57x	$61.44n	$67.50n	$18.11f	$25.41f
Baltimore	22.85	33.25	0.95	1.15	1.15	1.15	1.65	0.391	0.427x	56.25	64.25	0.1951	0.2745
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55	0.475	10.62	62.26	70.26	0.1715	0.2406
Boston	22.00	29.00	1.30	1.33	1.45	1.45	1.50	0.505	28.56op	59.373dd	65.51ddff	0.1946	0.2406
Chicago	26.80	26.80	1.55	1.60	1.90l	1.50	1.50	0.474	9.805ep	62.40dee	70.90dee	0.1715	0.2406
Cincinnati	21.60**	21.60**	1.75	1.75	1.75	1.38	1.44	0.400	8.66	60.95	66.70ff	0.1811	0.2541
Cleveland	28.00	43.00	1.13	1.16	1.24l	1.45	1.45	0.44aa	8.66	62.43	70.93	18.11f	25.41f
Dallas	29.80	31.80	1.05	1.21	1.37l	1.21	1.32	0.379	0.439x	55.00	63.00	0.1449	0.2029
Denver	25.00	25.00	1.45	1.35	1.50	1.40	1.55	0.444	9.80	60.19gg	70.69gg	0.1811	0.2541
Detroit	25.00	25.00	1.28	1.32	1.41	1.54	1.61	0.455	9.235	62.50f	71.00f	14.42foo	28.83f
Kansas City	30.00	35.00	1.20	1.30	1.40	1.35	1.50	0.451	10.95	62.32	70.32	19.46f	27.29f
Los Angeles	26.20	27.20	1.25xi	1.15*	1.25xi		1.60	0.484	9.90***a	61.85	82.10	0.1946	0.2729
Minneapolis	32.00	32.00	1.50	1.60	1.80	1.40	1.40	0.481	9.00	62.96	70.46ff	0.1768	0.2477
Montreal	28.80	33.20	1.10	1.30	1.30	1.15u	1.15u	0.437	9.25	66.50		0.264	0.322
New Orleans	32.00	45.00	1.25	1.25	1.35	1.25	1.25	0.422	8.303	62.04	70.54	0.1987	0.2796
New York	24.00	30.00	1.25	1.25	1.30	1.30	1.30	0.4744a	9.466e	63.23	71.73	18.11f	25.41f
Philadelphia	23.25	32.00	1.35	1.35	1.40			25.506ez	7.50e	53.23e	60.98e	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.32	1.35	1.35	0.42	9.19	56.81	62.63	0.2045	0.2572
St. Louis	29.00	40.00	1.35	1.60jj	1.55	1.60	1.65	0.434	9.80	62.83	69.08	20.54fm	28.83fm
San Francisco	27.85	32.00	1.20	1.20	1.40	1.20	1.20	0.49	8.90cc	66.90	75.42	0.1768	0.2477
Seattle	38.00	41.00	1.45	1.25k	1.85l	1.40k		0.422	8.303	64.10	72.60	0.1715	0.2406
Toronto	28.00	42.00	1.20	1.30	1.45			0.4215	24.00	71.00	80.50	0.30nnpp	0.3878pp

† trucklots, delivered * carload ‡ delivered *a f.o.b city *b ½" O.D. *c ¾" O.D. *d 100 lb *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h 15M lb *j 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob plant, fr allow *o 5M lb & up *p 100 sq ft quantity *r per lb *s 30¢ bag *t 36" x 96"; 10.81 lb/sh; 48" x 144"; 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 36" x 96" $13.25 sh *aa 16M lb & up *bb fob mill *cc 28" x 8-12" *dd add $0.75 cwt for boxing *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 50.4-lb, per sh. *ii 300-bag lots *jj per 100-lb bag *mm Theoretical wt: 19.7-lb per sh. *nn Deliv, warehouse means *oo ¼" O.D. *pp Incl 10%; sales tax *** Prev price on on 35" x 10'

Plant Trenches NEED CLEAN, DRY COVERS

TRENCHES in floors of industrial plants often house subsurface pipes, valves, etc. Often these trenches are covered with cast iron plates or wooden boards which collect grease, oil or water, making unsafe floor areas.

Trench covers of 75% open Irving metal grating remain safe because they will not collect these substances. In addition to providing drainage and traction, grating sections can be easily removed for access to trenches.

★

Manufacturers of Riveted, Pressure-Locked and Welded Gratings in Steel, Aluminum and other metals for over 50 years.

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IRVICO®

IRVING SUBWAY GRATING CO., Inc.
Originators of the Grating Industry

Offices and Plants at
5063 27th St., LONG ISLAND CITY 1, N. Y.
1863 10th St., OAKLAND 23, CALIFORNIA

Unit Prices

Capacity Added to N. C. Sewage Treatment Plant

New equipment to increase the capacity of Buffalo Creek Sewage Treatment Plant in Greensboro, North Carolina, from 3.5 mgd to 8 mgd will cost $1.2 millions. Hazen and Sawyer of New York are consulting engineers.

The bulk of the work goes to E. G. Singletary & Co. whose $1,144,600 contract is 2% above the engineer's estimate but 2.5% below the second low of six bids. The electrical work goes to Talley Electric Co., Inc., at $24,920. Heating and ventilating at $8,985 and plumbing at $17,425 go to Crutchfield Plumbing & Heating Co. All contractors are local firms.

The general contractor must maintain operation of the existing facilities. He will install a 42-in. influent sewer, a 16-mgd aerated grit chamber, mechanically cleaned bar screen and grinder, a primary settling tank, 80 ft in diameter with 9-ft side wall depth; two final settling tanks, 150 ft in diameter with 9-ft swd; a digestion tank, 80 ft in diameter with 30 ft swd; and two trickling filters, 155 in diameter and 7 ft deep. He will also install a 430-sq ft coil filter and an appurtenant sludge conveyor.

The site is close to the creek where ground water is extremely high during the wet months, however, no piles are required.

Bidders include:

General Work

1C E. G. Singletary & Co., Greensboro, N. C	$1,144,600
2 C. M. Guest & Sons, Anderson, S. C., & Greensboro, N. C	1,174,479
6 H. L. Coble Const. Co., Inc., Greensboro, N. C	1,233,289
EE Hazen & Sawyer, Engineers, New York, N. Y.	1,122,082

Bids: 10-30-56 Items		Lump Sum Price	% of Total
Clear, grub & strip		$5,200	0.42
Excavation & backfill		87,900	7.33
Concrete, cl A & cl B	*	242,425	20.25
Steel, reinforcing	*	77,420	6.45
Inside pipe, fittings, valves & gates		75,620	6.30
Piping	*	36,900	3.82
Joint materials		12,000	0.98
Granular material	*	5,240	0.43
Paving	*	13,125	1.09
Metal work, misc		20,000	1.64
Exist masonry, cut & remove		4,000	0.33
Exist piping & equip, remove & disp		8,000	0.66
Screens & screenings grinder		8,000	0.66
Grit chamber aeration equipment		4,000	0.33
Grit conveyor, tubular		9,000	0.74
Metering equipment		1,500	0.11
Sewage pumps main		20,000	1.64
filter effluent		7,000	0.57
recirculation		8,000	0.66
storm water		22,000	1.76
Sludge pumps, plunger type		5,000	0.41
centrifugal		3,500	0.28
Pump float controls & high water level alarm		1,500	0.11
Primary settling tank mechanism		10,000	0.82
Trickling filter		138,470	11.55
mechanism		25,000	2.07
Final settling tank mechanism		27,000	2.24
Chlorination equipment		14,000	1.16
Sludge digestion tank equipment		62,000	5.16
Gas equipment		4,000	0.32
Vacuum filtration equipment		62,000	5.16
Sludge cake handling equipment		16,000	1.33
Water meter & hydrants, install		300	0.01
Superstructures		60,000	4.99
Painting		7,000	0.57
Exist concrete surfaces, repair		1,500	0.11
Maintenance of operation		5,000	0.41
Top soil furnish	*	1,000	0.08
Final grading & seeding	*	5,000	0.41
Planting		2,000	0.16
Influent sewer		11,000	0.91
Exist primary tank, rehabilitate		16,000	1.33
Subtotal		$1,144,600	95.76
Electrical work	*	24,920	2.06
Heating & ventilation		8,985	0.74
Plumbing		17,425	1.44
Total		$1,195,930	100%

* See unit price bids

Item	Unit	Quantity	Unit Prices 1C	2
Concrete, cl A	cy	4,255	$55.00	$37.90
cl B	cy	210	40.00	21.66
Steel, reinforcing	lb	553,000	0.14	0.1645
CIP, yard, 6"	lf	270	4.00	4.90
8"	lf	570	5.00	6.50
12"	lf	195	7.00	12.00
24"	lf	110	18.00	40.00
30"	lf	20	35.00	90.00
RCP, sewer, 24"	lf	500	8.00	12.70
30"	lf	640	12.00	16.80
36"	lf	650	14.00	22.10
42"	lf	40	18.00	26.50
CP, sewer, 8"	lf	260	2.50	3.15
12"	lf	610	3.50	4.10
18"	lf	570	4.00	7.40
Drain pipe, conc, porous 8"	lf	200	1.00	3.50
6"	lf	260	3.00	2.55
4"	lf	225	2.00	1.80
Yard valves, 6"	ea	1	80.00	140.00
8"	ea	2	125.00	172.00
Granular material	cy	655	8.00	9.00
Paving	sy	5,250	2.50	3.12
Top soil, furnish	cy	1,000	1.00	3.25
Planting	sy	50,000	0.10	0.156

Brook Channel Improvement In Hartford, Connecticut

This $20,200 concrete spillway and stone paved channel will control the pond level and prevent overtopping of an earth embankment at Cedar Hill Cemetery.

The Hartford River Flood Control Commission, Charles W. Cooke, director, awarded contract to Raymond Construction Co. of Hartford whose price is 5.3% below the second low bid and 0.8% above the engineers' estimate. Metcalf & Eddy of Boston are consulting engineers.

The spillway is 77 ft long and 6 ft high and the channel is 260 ft long, 14 ft wide and 8 ft deep. The contractor has to protect trees on the site and handle the flow of the brook while the work is being done.

Specifications require that class A concrete test at 3,500 lb psi.

The seven bidders include:

1C Raymond Constr Co., Inc., Hartford, Conn	$20,200
2 P. Allergretti, Hartford, Conn	21,327
7 N. Benvenuti & Sons, New London, Conn.	32,215
EE Metcalf & Eddy, Boston, Mass.	20,037

Bids: 11-5-56 Items	Unit	Quantity	Unit Prices 1C	2
Excav, earth	cy	1,400	$3.00	$3.50
rock & disposal	cy	290	3.00	12.00
Remove exist culv & disposal	ls	job	300.00	100.00
Conc masonry work, cl A	cy	102	55.00	70.00
reinforcement	lb	3,600	0.20	0.50
Steel pipe 2"	lf	40	1.50	0.50
Stone paving, 12"	sy	305	20.00	9.00
18"	cy	42	30.00	9.00
Crushed stone, backfill	cy	8	10.00	8.00
Loaming & grassing	ls	job	500.00	500.00
Cleaning up	ls	job	500.00	200.00

Time to complete: 60 calendar days
Liquidated damages: $25.00 per day.

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 3 Massachusetts

Massachusetts—BEACH IMPRVS.—BA 1/15—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, central group bldgs., Horseneck Beach, bathhouse pavilion, parking areas, site imprvs., Westport. $900,000. Plans deposit $35, refundable. Coletti Bros., 687 Boylston St., Boston, archts. CD 10/18/55.

HEAVY CONSTRUCTION—LB & CA

† Davison Constr. Co., 1306 A Elm St., Manchester, N. H. LB $341,000, est. $362,700; commissary store, recreation workshop, etc., Portsmouth Air Force Base, ENG-19-016-57-102, PORTSMOUTH, N. H. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Dec. 11. CD 11/19.

Perini Corp., Marine Div., 62 Condor St., East Boston, Mass. LB $248,500, est. $236,300. (1 bidder) dredging Two Basin areas, Manchester Harbor, Manchester, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids Dec. 11. CD 11/27.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.
Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I. CA $616,442, est. $657,841; hy. and bridge work, Rte. 8, Marion and Wareham. CD 11/26, under LB.

▲† Theodore Loranger & Sons, 404 Nash Rd., New Bedford, Mass. LB $1,285,210; storage facility, Otis Air Force Base, ENG-19-016-57-65, FALMOUTH, MASS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Dec. 13. CD 12/3.

▲† B. Perini & Sons, Inc., 73 Montwait Ave., Framingham, Mass., and Raymond Concrete Pile Co., 31 St. James Ave., Boston, Mass. LB $7,139,321, est. $7,000,000. Pier No. 2 Bulkhead and utilities, U. S. Naval Submarine Base, NBy-1, NEWPORT, R. I. First Naval Dist., 495 Summer St., Boston, Mass. Bids Dec. 14. CD 11/13.

BUILDINGS—LB & CA

Raytheon Mfg. Co., Foundry Ave., Waltham, Mass. Owner Builds. $400,000; air-conditioning, dust-proofing, renovating old American Woolen MILL BLDGS. Shawsheen Village Electronic Plant, ANDOVER, MASS.

Kay-Locke, Inc., 32 Allerton St., Roxbury, Mass. CA Approx. $400,000. SCHOOL, Riverway and Longwood, BOSTON, MASS. Temple Israel, 260 Riverway, Boston, Mass. Bids Dec. 6. CD 11/19.

▲ Walsh Bros., 150 Hampshire St., Cambridge, Mass. CA Approx. $2,000,000; rebuild CHURCH, North Cambridge, CAMBRIDGE, MASS. St. John the Evangelist R. C. Church, c/o Chancery Office, 1 Lake St., Brighton, Mass. CD 12/18.

Rocheford Constr. Co., Inc., P.O. Box 369, Framingham, Mass. LB $609,000, est. $600,000; rebuild Y.M.C.A. BLDG., HAVERHILL, MASS. Young Men's Christan Assoc., Winter St., Haverhill, Mass. Bids Dec. 11. CD 11/20.

▲ Tornabene Brothers Co., 170 Needham St., Newton Upper Falls, Mass. LB LB $1,789,000. SENIOR HIGH SCHOOL, ROCKLAND, MASS. Town, School Bldg. Comm., High School Bldg., Taunton Ave., Rockland, Mass. Bids Dec. 12. CD 11/14.

† Franchi Constr. Co., 216 Webster St., West Newton, Mass. CA $522,418, est. $512,050. Army reserve TRAINING CENTER, American Legion Parkway, ENG-19-016-57-105, ROSLINDALE, MASS. U. S. Eng., 150 Causeway St., Boston, Mass. CD 11/27, under LB.

▲ U. S. Eng., 150 Causeway St., Boston, Mass. cancelled bids to have been opened Dec. 11, construct and finance, Capehart HOUSING, 98-units, on site imprvs. and utilities, Bristol, North Kingston, Foster, North Smithfield and Coventry, RHODE ISLAND. Est. $1,518,000. CD 11/8.

▲ Samuel P. Lazarus, 235 Freeman Parkway, Providence, R. I., cancelled bids to have been opened Sept. 26, Philip Garden APARTMENTS, Blackstone Blvd., PROVIDENCE, R. I. Est. $1,000,000. CD 9/12.

Myrose Constr. Co., 299 Main St., East Hartford, Conn. CA $557,900. Proj. MR-58, moderate rental HOUSING, EAST HARTFORD, CONN. East Hartford Housing Auth., 70 Cannon Rd., East Hartford, Conn. Bids Nov. 29, awarded Dec. 11. CD 12/5, under LB.

Brown & Matthews, Inc., 404 Fourth Ave., New York, N. Y. CA $470,000. 1 story MFG. PLANT and OFFICE, Keeler Ave., NORWALK, CONN. Maral Holding Corp., 404 Fourth Ave., New York, N. Y. P. Schuyler Van Bloom, 404 Fourth Ave., New York, N. Y., engr. Awarded Dec. 13.

F. D. Rich Co., Inc., 322 Main St., Stamford, Conn. LB $672,850 (6 bidders) 3 story, brick, limestone trim COURT HOUSE, Hoyt St., STAMFORD, CONN. Comrs. Fairfield Co., 172 Golden Hill St., Bridgeport, Conn. Bids Dec. 6. CD 11/14.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

January 3 New Jersey — January 4 Pennsylvania

STREETS AND ROADS

January 3 New Jersey — January 4 Pennsylvania

D. C., Wash.—POWER PLANT SWITCH GEAR—BA 1/3 General Services Admin., Regional Office Bldg., 7th and D Sts., S.W., power plant switchgear control switchboard at Howard University. Plans deposit $10.

† Md., Aberdeen Proving Grounds—HYPERSONIC WIND TUNNEL—BA 1/25—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, installing hypersonic wind tunnel equip., ENG-18-020-57-19. $500,000-$1,000,000. Plans deposit $25. Burns & Roe, Inc., 160 W. Broadway, New York, Zone 13, engr. CD 11/13, under LB.

Pa., Lansdale—BA 2/7—Lansdale Boro, sewerage treatment plant, sewerage sys. imprvs. $450,000. Pantech, Inc., 5847 Center Ave., Pittsburgh, engr. CD 11/13.

BUILDINGS—BA

▲ Pa., Phila.—BANK and OFFICE—BA 1/3—Land Title Building Corp., c/o Albert M. Greenfield & Co., Inc., 1325 Walnut St., bank and office modernization, Land Title Bldg. $4,500,000. Thalheimer & Weitz, 1325 Walnut St., archts. CD 2/13.

▲ N. Y., New York—SCHOOL—BA 1/24—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., Junior High School 22, Sheriff St. between Stanton and Houston Sts., Manhattan. Plans deposit $25. CD 6/23/56.

▲ N. Y., West Seneca—SCHOOL—BA 1/10—West Seneca Central School, 3330 Seneca St., Buffalo, Zone 24, Junior High School, $2,557,000. Plans deposit $25, Pfohl & Stoll, 185 Niagara St., Buffalo, archts. CD 5/18.

▲† N. Y., Bellmore—SHOP—BA On Or About 1/22—U. S. Eng., 111 E. 16 St., New York, Zone 3, field maintenance shop, (FY 1957), ENG-30-075-57-190. $1,000,000-$1,500,000. Plans deposit $100.

HEAVY CONSTRUCTION—LB & CA

▲ Tully & DiNapoli, Inc., 127-50 Northern Blvd., Flushing, N. Y. CA $1,169,668; constr. pools, landscaping and bridge in Central Terminal area, New York International Airport, Contr. NYA 650.002, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 11/29, under LB.

▲ Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, N. Y. CA $3,693,543 (3 bidders) lateral sewers, Hewlett, Grant Park, Hewlett Point, Bay Park, Angle Sea and incorporated villages of East Rockaway and Lynbrook, town of Hempstead Sewage Collection Dist. 5-Elm Contr. No. 1002-2-E1M-1, MINEOLA, N. Y. County Exec. Nassau Co., Old County Court House, Mineola, N. Y. CD 11/29, under LB.

Tibbetts Contg. Corp., 1 Lawton St., Yonkers, N. Y. CA $910,950. Contr. 439, approx. 6 mi. sewers, incl. railroad crossing, 4 stream crossings, manholes, and other appurtenances, approx. 6 mi. house connections in village of Margaretteville and hamlet of Arkville, town of Middletown, Delaware Co., NEW YORK, N. Y. Bd. Water Supply, 120 Wall St., New York, N. Y. CD 11/29, under LB.

▲† George M. Brewster & Son, Inc., 275 West Fort Lee Rd., Bogota, N. J. LB $16,827,311 (10 bidders) runway, taxiway, support facilities, (FY 1956-1957) Griffiss Air Force Base, ENG-30-075-57-67, ROME, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Dec. 18. CD 12/14.

▲ MARYLAND—State Rds. Comm., 108 E. Lexington St., Baltimore, Zone 2.
Williams Constr. Co., Box 4045, Baltimore 20, Md. LB $2,827,072. surf. 3.883 mi. dual hy. Baltimore Co. Beltway, Contr. B 635-5-420, Baltimore Co. Bids Dec. 11. CD 12/3.

MARYLAND—State Rds. Comm., 108 E. Lexington St., Baltimore, Zone 2.
Cumberland Constr. Co., Box 4045, Cumberland, Md. CA $758,767. relocation, surf. 3.193 mi. State Rte. 36 Corriganville, Contr. LA 465-1-620, Allegany Co. CD 12/11, under LB.

▲ Gunnell Constr. Co., Tower Bldg., Wash., D. C., LB $1,327,000 (8 bidders) constr. sewer in Square No. 635 site of proposed additional office bldg. for house of representatives, WASH., D. C. Office of the Architect of the Capitol, U. S. Capitol, Wash., D. C. Bids Dec. 12. CD 12/11.

BUILDINGS—LB & CA

▲ Planet Constr. Corp., 11 W. 42 St., New York 36, N. Y. LB $1,582,000 (7 bidders) general constr., PUBLIC SCHOOL 105, Beach 51 St. between Elizabeth Ave. and Beach Channel Dr., Queens Boro, NEW YORK, Director Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 18. CD 11/21.

▲ John Rosenblum, Inc., 1860 Broadway, New York 23, N. Y. LB $1,715,000 (7 bidders) general constr. Public School 221, Marathon Parkway and 60 Ave., Queens Boro, NEW YORK. Director Bureau Constr. 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 13. CD 11/14.

▲ Malan Constr. Corp., 2 Park Ave., New York, N. Y. LB $2,852,000. alternating gradient synchrotron at Brookhaven National Laboratory, incl. 25,000 sq. ft. 50 ft. high target bldg., 7,000 sq. ft. Linac Bldg., five small air-conditioning penthouses, 6,000 ft. underground pressure piping, constr. four well houses, installation of concrete access tunnels, road network, large paved parking areas for AEC, BROOKHAVEN, N. Y. Stone & Webster Engineering Corp. for Brookhaven National Laboratory, Associated Universities, Inc., Upton, L. I., N. Y. Bids Nov. 27. CD 10/26.

▲ Laurence J. Rice, Inc., 61-40 Maurice Ave., Maspeth, N. Y. LB $2,674,000 (8 bidders) general constr. JUNIOR HIGH SCHOOL 211, Ave. K between 100 and 101 Sts., BROOKLYN, N. Y. Director, Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 14. CD 11/19.

▲ M. W. Kellogg Co., 711 Third Ave., New York, N. Y. CA Est. $2,000,000. 2,435 bbl per day SULFURIC ACID ALKYLATION UNIT, BUFFALO, N. Y. Socony Mobile Oil Co., 26 Broadway, New York, N. Y.

Whitson-Glen Homes, c/o John J. Klaber, archt., 41 Prime St., Huntington, N. Y. Owner Builds. $800,000. 38 HOUSES on tract at Whitson Rd. near Park Ave., HUNTINGTON, N. Y.

▲ Depot Constr. Corp., 42-15 Crescent St., Long Island City 1, N. Y. CA $5,900,000. general constr. Fashion INSTITUTE of Technology, West 27 and 28 Sts. between 7th and 8th Aves., Manhattan Boro, NEW YORK, N. Y. Bd. Educ. Bureau Constr., 42-15

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

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reduce the cost of slab floor construction!

Mystic Seaport Accessions Bldg., Mystic, Conn. Lovello & Naccarato, Contractors. Architect: Francis D. Rogers, Rogers & Butler, NYC and O. E. Liebig, New London. Photo by Martel.

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Available in sizes 2.25" to 36.9" O.D. up to 50' long. End closures available.

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AKRON, IND. • LONGVIEW, TEXAS • BRANTFORD, ONT. • MEXICO, D. F.

Crescent St., Long Island City 1, N. Y. CD 11/22, under LB.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y. and **John Lowry, Inc.**, 52 Vanderbilt Ave., New York 17, N. Y. CA Est. $70,000,000. 47 story OFFICE, west side of Avenue of Americas from 50 to 51 Sts., NEW YORK, N. Y. Rockefeller Center, Inc., and Time, Inc., 50 Rockefeller Plaza, New York 20, N. Y. Harrison & Abramovitz, 630 Fifth Ave., New York 20, N. Y., archts. Syska & Hennessy, Inc., 144 E. 39 St., New York 16, N. Y., mech. engr. Edwards & Hjorth, 67 W. 44 St., New York 36, N. Y., struct. engrs.

▲ **Diesel Constr. Co.**, 24 W. 58 St., New York 19, N. Y. CA Est. $12,000,000. 30 story OFFICE, 200 E. 42 St., southeast corner of Third Ave., NEW YORK, N. Y. Syndicate, c/o Joseph Durst, 205 E. 42 St., New York 17, N. Y. Emery Roth & Sons, 575 Madison Ave., New York 22, N. Y., archts.

Kreisler-Borg Constr. Co., 48 Mamaroneck Ave., White Plains, N. Y. CA $420,400. Valley Cottage SCHOOL addns., Hilltop SCHOOL addns., NYACK, N. Y. Bd. Educ., Nyack, N. Y. CD 8/30.

▲ **A. Friederich & Sons Co.**, 710 Lake Ave., Rochester, N. Y. CA $1,223,996. general constr. 7 story, rein.-con. ramp GARAGE, ROCHESTER, N. Y., City, City Hall, Rochester, N. Y. CD 11/15, under LB.

▲ **Wenwood Homes**, c/o Stanley Shaftel, archt., 166-21 90 Ave., Jamaica, N. Y. Owner Builds. $14,000,000. 1,200 HOUSES on 200 acre tract on Jericho Turnpike, SELDEN, N. Y.

▲ **Guild Constr. Co.**, 94 Water St., Providence, R. I. CA piling for SYSTEMS ENGINEERING BLDG., 2 story laboratory and office, for design of air conditioning equip., SYRACUSE, N. Y. Total est. cost $1,500,000. Carrier Corp., 330 S. Geddes St., Syracuse 1, N. Y. A & F Curtis King, Marine Midland Bldg., Syracuse, N. Y., archts., Galson & Galson, 211 E. Fayette St., Syracuse, N. Y., engrs.
American Bridge Co., Elmira, N. Y. CA steel erection (Syracuse, N. Y.).

James King & Son, Inc., 350 Fifth Ave., New York 1, N. Y. LB $481,777 (4 bidders) modernization of Bldg. 36 at Utica State Hospital, UTICA, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Dec. 13. CD 3/16/55.

Tanwood at Woodbury Hills, c/o Butterly & Green, Inc., 168-25 Hillside Ave., Jamaica, N. Y. Owner Builds. $435,000. 15 HOUSES on tract at Plainview Rd. south of Jericho Turnpike, WOODBURY HILLS, N. Y.

William H. Schaaf, Baptistown, N. J., LB $986,359. SCHOOL EXPANSION, ANNANDALE, N. J. Bd. Educ., North Hunterdon Regional High School Dist., Annandale, N. J. Bids Dec. 4. CD 9/18.

▲ **Beechwood Acres**, c/o C. J. Kordys, archt., 116 Passaic St., Passaic, N. J., Owner Builds, $4,250,000. 175 HOUSES, on tract at Oradell and Isnant Aves., ORADELL, N. J.

▲ **SD Plants, Inc.**, 2 Park Ave., New York, N. Y. CA $8,000,000. ethylene oxide and gycol PLANT, LINDEN, N. J. General Aniline & Film Corp., Grasselli St., Linden, N. J. CD 3/23.

▲ **American Building & Constr. Co.**, 191 Broadway, Long Branch, N. J. CA $1,667,772. constr. HIGH SCHOOL, Grove St., METUCHEN, N. J. Bd. Educ., Borough of Metuchen, N. J. Mickiewright & Mountford, East Stuyvesant Ave., Trenton, N. J., archts.

▲ **William L. Blanchard & Co.**, 45 Poiner St., Newark, N. J. CA $1,000,000. 6 story OFFICE BLDG. at N.E.C., Broad and Bridge Sts., NEWARK, N. J. 494 Broad St. Corp., 494 Broad St., Newark, N. J. Frank Grad & Son, 11 Commerce St., Newark, N. J., archts.-engrs.

▲ **I. Manin**, 4219 Wynnefield Ave., Phila., Pa. CA $2,500,000. Cheltenham Park APARTMENTS and swimming pool, Easton Rd., GLENSIDE, PA. Ginsberg & Ginsberg, 1705 W. Columbia Ave., Phila., Pa. G. Harold Murphy, 1621 Sellers St., Phila., Pa., archt. CD 4/15/55.

▲ **Dick Constr. Co.**, Rte. 51, Large, Pa. LB $1,333,333. 3 story, bsmnt., 159x68 ft., 85x108 ft. 2 story, 162x135 ft., 3 story, 75x98 ft., brick, steel Baldwin Twp. HIGH SCHOOL addn., Whitehall Boro, PITTSBURGH, PA. Baldwin Twp. School Dist., Whitehall Boro, Pittsburgh, Pa. Bids Dec. 3. CD 11/28.

▲ **Navarro Corp.**, 6219 Broad St., Pittsburgh, Pa. CA $2,499,700. 8 story, bsmnt., 150x165 ft., L-shaped brick, steel HOSPITAL addn., alterations, PITTSBURGH, PA. St. Francis Hospital, 45 St., Pittsburgh, Pa. CD 9/26, under LB.

▲ **Navarro Corp.**, 6219 Broad St., Pittsburgh, Pa. CA Est. $3,000,000. 8 story, bsmnt. APARTMENT, 128 units, Craig and Fifth Ave., PITTSBURGH, PA. Park Plaza, Inc., Commonwealth Bldg., Pittsburgh, Pa. CD 5/8.

Chartley Farms, Inc., 711 St. Paul St., Baltimore 2, Md. Owner Builds. $675,000. 45 frame, masonry HOUSES, Northway Rd., Shirley Manor Rd. and Sally Court, near BALTIMORE, MD.

Thos. Hicks & Sons, 106 W. Madison St., Baltimore 1, Md. CA $400,000. 1 story, 136x240x34 ft. brick STORAGE and OFFICE, 428 E. Preston St., BALTIMORE, MD. Williams & Wilkens Co., Mount Royal and Guilford Aves., Baltimore 2, Md. Van R. P. Saxe, 1701 St. Paul St., Baltimore 2, Md., engr.

John K. Ruff, Inc., 3010 Ridgewood Ave., Baltimore 15, Md. CA $822,000. 1 story, brick, concrete, steel Groveland Elementary SCHOOL, Arlington, BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids Nov. 7, awarded Nov. 14. CD 11/13, under LB.

Silver Ridge Constr. Co., 149 E. Equitable Bldg., Baltimore 2, Md. Owner Builds. $540,000. 54 brick HOMES, Langford Rd., Ingleside Park Section, BALTIMORE, MD.

Wildberger-Best Constr. Co., 2025 E. North Ave., Baltimore 13, Md. CA $942,460. concrete, steel, masonry Hazelwood Elementary SCHOOL, BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. CD 12/18, under LB.

▲ **Charles E. Brohawn & Bros.**, Cambridge, Md. CA $1,747,977. BUILDING on Delmar Rd., near SALISBURY, MD. Eastern Shore Public Service Co. of Maryland, 114 N. Division St., Salisbury, Md. Malone & Williams, Lloyd and Hanson Sts., Salisbury, Md., archts.

Hicks-Tate, Inc., 5019 York Rd., Baltimore 12, Md. LB $544,773. (7 bidders) masonry Owing Mills Elementary SCHOOL addn., alterations, Owings Mills, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson, Md. Bids Dec. 11. CD 12/5.

▲ **Mullan Contg. Co.**, 3945 Greenmount Ave., Baltimore 18, Md. CA $2,743,000. 2 story, brick, concrete, steel, block Arbutus JUNIOR HIGH SCHOOL, Sulphur Spring Rd., Arbutus, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson, Md. CD 11/13, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
January 30 Louisiana

STREETS AND ROADS
January 3 Florida

▲† **Va., Langley Air Force Base**—RUNWAY EXTENSION—BA 1/17—U. S. Eng., foot of Front St., Norfolk, Zone 1, runway 7-25 extens., ENG-44-110-57-13. $2,400,000. CD 8/24.

† **Florida**—BA About 1/18—U. S. Eng., P. O. Box 4970, Jacksonville 1, Fla., Schedule A, Levee 23, Schedule B, Levee 24, and Schedule C, Levees 23 and 24 combined, Miami Canal in West Palm Beach Co., central and southern Florida. Flood Control Project, CIVENG-08-123-57-43. CD 8/13.

Ky., Fort Knox—SUPPORTING FACILITIES—BA 1/22—U. S. Eng., 830 W. Broadway, Louisville, supporting facilities, bit. surf. roads, concrete gutters, pipe culverts, sanitary sewers, c.i. force mains, water lines, gas lines for Capehart Housing, Inv. 15-029-57-24. $700,000. Extended date. Warren Van Praag, Inc., 253 S. Park St., Decatur, Ga., consult. engr. CD 11/21.

† **La., Alexandria**—HIGH ALTITUDE TRAINING BLDG.—BA 1/22—U. S. Eng., P. O. Box 867, Little Rock, Ark., Job No. England AFB-ACRP-AF, high altitude training bldg., Item No. 6-006 (F 272-000), England Air Force Base, ENG-03-050-57-15. Extended date. CD 11/14.

BUILDINGS—BA

Ky., Owensboro—HOSPITAL—BA 1/4—Our Lady of Mercy Hospital, Junction and Ford Ave., 4 story, hospital addn. $900,000. Thos. J. Nolan & Sons, Kentucky Home Life Bldg., Louisville, archt. Southern Eng. Co., 322 W. Jefferson St., Louisville, engr. CD 11/9.

Ky., Louisville—SCHOOL—BA 1/4—Jefferson Co., Bd. Educ., 618 N. Jefferson St., Mayme Waggener Junior High School. $529,124. Hartstern, Louis & Henry, McDowell Bldg., archts. E. R. Ronald & Assoc., 554 S. Third St., engrs. CD 10/29.

▲ **La., Alexandria**—HOUSING—BA 1/23—Contg. Officer, Base Procurement Office, England Air Force Base, Alexandria, construct and finance 300 family housing units, (Capehart), Bids No. 16-600-57-34, $3,500,000. Extended date. CD 11/13.

HEAVY CONSTRUCTION—LB & CA

† **Norfolk Dredging Co.**, Campostella Wharf, Norfolk, Va., CA $512,911, dredging, rehandling and mooring basins and approaches, Craney Island Rehandling Proj., Norfolk Harbor, dredging approach and mooring area, mooring basin, access channels and rehandling basin to depth of 30 ft., 21 ft., 18 ft. and 40 ft. respectively with 1 ft. allowable overdepth, CIVENG-44-110-57-3, VIRGINIA. U. S. Eng., foot of Front St., Norfolk, Va. CD 7/31/53.

▲† **McDonough Constr. Co. of Ga.**, 7 Baltimore Pl., N. W., Atlanta, Ga., CA $2,669,444, bachelor officers quarters and 1,600 man subsistence bldg., seven enlisted mens' barracks, NBy 4965, U. S. Naval Minecraft Base, CHARLESTON, S. C. P. Wks. Officer, Dpt. Navy, U. S. Naval Base, Charleston, S. C. Bids Dec. 6. CD 11/7.

† **Eastern Contractors, Inc.**, 1517 Heatherwood Rd., Columbia, S. C., CA $510,155, two airmen's dormitories, Myrtle Beach Air Force Base, ENG-38-081-57-9, MYRTLE BEACH, S. C. U. S. Eng., Customhouse, Charleston, S. C. Bids Nov. 29. CD 12/5, under LB.

▲ **GEORGIA**—State Hy. Dpt., 2 Capitol Square, Atlanta, Ga.—**Dixie Constr. Co., Inc.**, 747 Wheaton St., Savannah, Ga. LB $1,391,952. (14 bidders) interchange and by-pass on US 41 at Forsyth, 5.17 mi. of 4-lane limited access paving with 3 grade structures and service roads along side. Proj. No. 1-401-2 (1), Monroe Co.;

Ga.—**W. L. Robinson Constr. Co.**, 1224 W. Rugby Ave., College Park, Ga. LB $863,843. (12 bidders) grading, paving 11.508 mi., 2 bridges on Madison to Quitman Rd., Proj. F 032-2 (5), Brooks Co.;

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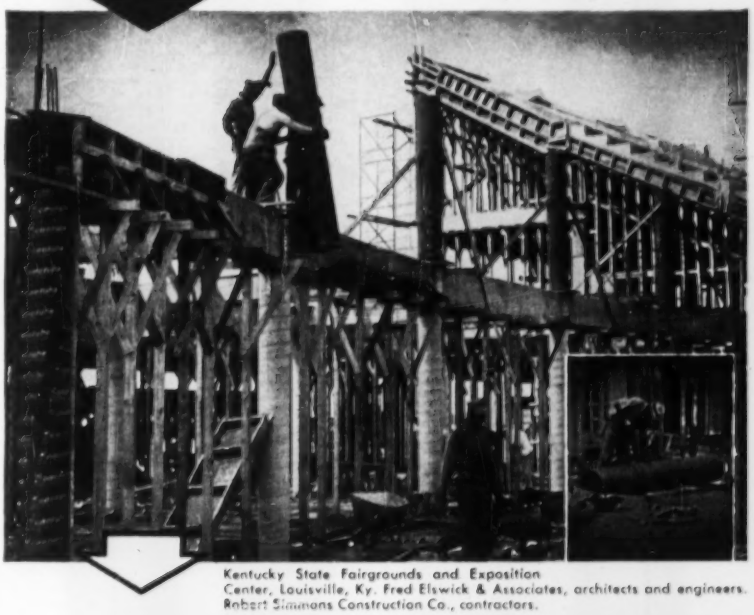

Kentucky State Fairgrounds and Exposition Center, Louisville, Ky. Fred Elswick & Associates, architects and engineers. Robert Simmons Construction Co., contractors.

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AKRON, IND. • LONGVIEW, TEXAS • BRANTFORD, ONT. • MEXICO, D. F.

Ga.—**Hugh Steel Constr. Co.**, P. O. Box 398, Centre, Ala. LB $534,437. (15 bidders) grading, paving 7.328 mi. 1 bridge, Carrollton-Atlanta Rd. Proj. S 0841 (3) and S 0750 (2), Douglas Co.;

Ga.—**Acme Concrete Constr. Co.**, Cochran, Ga. LB $99,125. (2 bidders) grading, reconstr. 0.569 mi. Hawkinsville on Montezuma Rd., Proj. F 028-2 (2), Pulaski Co.;

Ga.—**Cecil H. Dunn Constr. Co.**, P. O. Box 568, Moultrie, Ga. LB $126,181. (11 bidders) grading, paving 7.821 mi. Thomasville-Ga. 37 Rd., Proj. S 1252 (2), Colquitte Co.; LB $182,173. (2 bidders) wid'n, reconstr. 0.67 mi. Moultrie-Tifton Rd. in Moultrie, Proj. F 033-1 (6), Colquitt Co.;

Ga.—**E. A. Hudson's Sons**, 1730 Hollywood Rd., Bolton, Ga. LB $260,162. (6 bidders) grading, paving 7.047 mi. and 2 bridge culverts on Roopville-Whitesburg Rd., Proj. S 0844 (3), Carroll Co.;

Ga.—**Kennedy Constr. Co.**, P. O. Box 266, Ashburn, Ga. LB $125,024. (14 bidders) grading, paving 4.989 mi. Cordele-Hawkinsville Rd., Proj. S 0534 (2), Dooly Co.;

Ga.—**Lothridge Bros.**, P. O. Box 81, Gainesville, Ga. LB $382,548. (9 bidders) grading, paving 7.53 mi., 1 bridge on Waleska-Tate Rd., Proj. S 0857 (3), Cherokee and Pickens Counties; LB $164,854. (12 bidders) grading, paving 4.704 mi., 1 bridge and 1 bridge culvert on Homer-Carnesville Rd., Proj. S 0888 (2), Franklin Co.;

Ga.—**Shepherd Constr. Co.**, P. O. Box 8068, Station F, Atlanta, Ga. LB $102,368. (8 bidders) wid'n. reconstr. 1.228 mi. Newton Bridge Rd., Proj. PR 279E (1), Clarke Co.;

Ga.—**L. A. Thigpen**, P. O. Box 213, Sylvania, Ga. LB $213,875. (16 bidders) grading, paving 11.543 mi. 1 bridge culvert on Alma-Jesup Rd., Proj. S 1719 (1), Bacon and Pierce Counties;

Ga.—**West-Ledbetter Co.**, 102 Clark St., Rome, Ga. and **Mirage Constr. Co.**, P. O. Box 1427, Rome, Ga. LB $492,319. (8 bidders) wid'n., reconstr. 7.587 mi. US 411 from Tennga to Crandall on Benton, Tenn.-Chatsworth Rd., Proj. F 018-1 (10), Murray Co. Bids Dec. 14. CD 12/4.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Cone Bros. Contg. Co., Box 1301, Tampa, Fla. LB $897,785. (3 bidders) limerock base, type 1A surf. tr.; constr. beach erosion protection consisting of groins, rock fill and jetties, Longboat Inlet bridge approaches, SR 780, S.P. Job No. 1308-176, Manatee Co.; LB $416,490. (6 bidders) 600 ft. bridge of prestressed concrete deck girder spans on prestressed concrete pile bents 1.528 mi., Kissimmee River Bridge and approaches, SR 60, S.P. Jobs Nos. 9207-107 and 1613-112, Osceola and Polk Counties. Bids Dec. 13. CD 11/29.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Fla.—**Marion Constr. Co.**, Box 577, Ocala, Fla. LB $1,082,436. (6 bidders) limerock base with type 1 6 conc. surf. one 100 ft., one 160 ft. concrete slab bridge on precast concrete piling 14.591 mi., SR 5 (U.S. 1), F.A.F. 003-6 (8), Job. No. 7801-275, St. Johns Co.;

Fla.—**White Constr. Co., Inc.**, Chiefland, Fla. LB $899,358. (11 bidders) limerock base with type 1 b. conc. surf. course 12.914 mi., SR 10 (U.S. 90), F.A. Proj. F 006-4 (8), Job. No. 3501-206, Madison Co.; LB $179,060. (5 bidders) limerock stabilized base 2.295 mi., SR S-346, S.P. Job. No. 3460-150, Levy Co.;

Fla.—**W & M Constr. Co.**, Williston, Fla. LB $102,479. (6 bidders) limerock stabilized base, box culvert 4.65 mi. SR S 241-A, S.P. Job No. 3955-175, Union Co.;

Fla.—**Smith Engineering & Constr. Co.**, Drawer 1831, Pensacola, Fla. LB $1,148,694. (3 bidders) shell base with type 1-A surf. tr. 4.492 mi. SR 85, F.A. Proj. F 041-1 (2), Job No. 5704-203, Okaloosa Co.;

Fla.—**Troup Bros., Inc.**, Box 158, Miami 33, Fla. LB $507,527. (5 bidders) limerock base type 2 surf. tr. 4.341 mi. SR A-1-A, S.P. Job No. 9405-109, St. Lucie Co.;

Fla.—**J. D. Manly Constr. Co.**, Box 586, Leesburg, Fla. LB $524,669. (4 bidders) limerock base with type b conc. surf. course 2.544 mi., SR 44 and 500, (U.S. 441) F.A. Proj. F 002-1 (7), Job. No. 1102-208, Lake Co.;

Fla.—**R. H. Wright & Son**, Box 781, Fort Lauderdale, Fla. LB $1,362,891. (5 bidders) limerock base with type 1 b conc. surf. course binder course, twin 120 ft. concrete slab bridges on concrete or composite piling 3.011 mi. SR 5 (U. S. 1), F.A. Proj. F 003-1 (1) Job No. 9002-205, Monroe Co.;

Fla.—**Ewell Eng. & Contg. Co.**, Box 791, Lakeland, Fla. LB $82,869. (7 bidders) limerock base, surf. tr. 1.515 mi. SR S 575, S.P. Job No. 1453-150, Pasco Co. Bids Dec. 13. CD 11/29.

† **Ralph E. Mills & Co.**, 410 Ann St., Frankfort, Ky. LB $472,379. Proj. 1A7-3A1-11A1-11B1, grading, drainage, processing Oolite Rock Base, bituminous prime coat and surface treatment, seeding, etc., Park Rd. from Paradise Key Rd. to point about 11 mi. west and about 4 mi. of other roads Everglades National Park, Dade Co.; FLORIDA Bureau Pub. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va. Bids Dec. 13. CD 11/21.

† **Hardaway Contr. Co.**, P.O. Drawer "F", Tampa, Fla. CA $966,870. constr. south jetty and revetment, St. Augustine Harbor, CIVENG-08-123-57-28, St. Augustine Harbor, FLORIDA. U. S. Eng., Box 4970, Jacksonville. Bids Dec. 4, awarded Dec. 12. CD 12/11; under LB.

† **McAllister-Davis Co.**, 1439 Bellevue St., Memphis, Tenn., CA $118,400, Item M-714-L Promised Land Levee shore erosion prevention Plaquemines Parish, CIVENG-16-017-57-104. LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La.

† **Lionel F. Favret Co., Inc.**, 937 Gravier St., New Orleans, La. CA $619,872. supply facilities at Naval Auxiliary Air Station, NBy 1191, NEW IBERIA, LA. Eighth Naval Dist., Bldg. 16, Naval Station, New Orleans, La. Bids Dec. 6, awarded Dec. 12. CD 12/12, under LB.

▲† **Robert Simmons Constr. Co.**, 840 Barrett Ave., Louisville, Ky. CA $1,867,104. facilities for Air National Guard Standiford Field, ENG-15-029-57-23, LOUISVILLE, KY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Nov. 20, awarded Dec. 13. CD 11/27.

▲† **Tennessee**—Tennessee Valley Auth., New Sprankle Bldg., Knoxville,
WILSON DAM
Alpha Portland Cement Co., 1st Natl. Bldg., Birmingham, Ala., **Lone Star Cement Corp.**, Comer Bldg., Birmingham, Ala. and **Lehigh Portland Cement Co.**, 718 Hamilton St., Allentown, Pa., CA totaling $1,035,000 for cement;
Ralph Rogers & Co., Inc., 720 Argyle Ave., Nashville, Tenn., CA $1,502,705, concrete aggregates (Tennessee);
Nashville Bridge Co., Shelby Ave., Nashville, CA $97,427, supply miter sills and bases for lower gate, Wilson Dam (Tennessee);
Graybar Electric Co., Inc., 210 N. Highland Park Ave., Chattanooga, Tenn., CA $134,462, steel conduit, Wilson Dam (Tennessee). Grand total $2,769,594.

BUILDINGS—LB & CA

▲ **J. W. Bateson Co., Inc.**, Gibraltar Life Bldg., Dallas, Tex., LB $2,174,500 (5 bidders) construct and finance, 150 units, Capehart family HOUSING, 30 bldgs. ENG-44-110-57-1 and 2, FORT STORY, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids Dec. 12. CD 11/21.

▲ **Nielsen Constr. Co., Inc.**, Harrisonburg, Va. LB $1,187,404. (5 bidders) DORMITORY Nos. 33 and 39, HARRISONBURG, VA., Madison College, Harrisonburg, Va. J. Binford Walford-O. Pendleton Wright, 615 Dinwiddie St., Norfolk, Va., archts. Bids Dec. 11. CD 3/14/55.

A & P Constr. Co., 419 W. 22 St., Norfolk, Va. LB $481,700. (8 bidders) Woodstock Elementary SCHOOL, PRINCESS ANNE, VA. Princess Anne Co. School Bd., Court House, Princess Anne, Va. Oliver & Smith, 409 Yarmouth St., Norfolk, Va., archts. Bids Dec. 11. CD 7/13.

▲ **C. D. Spangler Constr. Co.**, 1028 S. Blvd., Charlotte, N. C. LB $6,598,500. (6 bidders) construct and finance, 435 HOUSING units, Armed Services Proj., Marine Corps Air Facility New River, NBy-(CH) 3717, Proj. No. 053-81001-MC-1, JACKSONVILLE, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Dec. 14. CD 12/4.

General Constr. Co., 1815 Blanding St., Columbia, S. C. CA $600,000. 62,000 sq. ft. mfg. PLANT, BENNETTSVILLE, S. C. Bennettsville Mfg. Co., Bennettsville, S. C. Bids Oct. 30. CD-10/24.

E. O. Smithfield Contractors, 700 Antone Ave., N. W., Atlanta, Ga., LB $387,800. Tilson Road Elementary SCHOOL, 20 classroom unit, incl. cafeterium, DECATUR, GA., DeKalb County School Bd., 430 McDonough St., Decatur, Ga. CD 11/5.

United Builders, Inc., 934 S. McDonough St., Montgomery, Ala. CA $521,622. (14 bidders) Oglethrope HIGH SCHOOL, colored SCHOOLS in Ideal, Marshallville and Montezuma, OGLETHORPE, GA. Macon Co., Oglethorpe, Ga. Bids Dec. 11. CD 11/13.

Magna Constr. Co., 815 Progresso Dr., Fort Lauderdale, Fla., LB $680,788. CO-OP APARTMENT, S. Surf Rd. and Greenbriar Terrace, HOLLYWOOD, FLA. First Realty Corp., c/o Louis Wolfe, archt., 3025 N. Atlantic Blvd., Fort Lauderdale, Fla. Bids Dec. 12. CD 11/28.

▲ **Hargett Constr. Co.**, 113 Walton Ave., Lexington, Ky. CA $1,972,700. Shawneetown HOUSING, incl. six 3 story buildings, University of Kentucky, LEXINGTON, KY. State Div. Purchases, Frankfort, Ky. Bids Sept. 25, awarded Dec. 14. CD 9/28.

▲ **Austin Co.**, 16112 Euclid St., Cleveland, O. CA Est. $8,000,000, design and construct Chemical PLANT to produce magnesia and basic refractory products, PASCAGOULA, MISS. H. K. Porter Co., Inc., 300 Park Ave., New York 22, N. Y.

▲ **Joseph Dahlem Constr. Co.**, 984 Baxter Ave., Louisville 4, Ky. Owner Builds. $1,000,000. SHOPPING CENTER, incl. 2 supermarkets, 2 department stores, Preston Hy. and Indian Trail, to be called Indian Trail Trading Post, LOUISVILLE, KY.

▲ **Jack Durrett, Inc.**, 5913 Preston Hy., Louisville, Ky. CA Est. $1,000,000. SHOPPING CENTER, 12 stores, branch bank, 5 professional offices, service station, parking space, LOUISVILLE, KY. Bittersweet Shopping Center, Preston Rd., Louisville, Ky. Awarded Oct. 31.

Sullivan & Cozzart, 822 W. Kentucky St., Louisville, Ky. LB $775,800 (5 bidders) general constr. Goldsmith JUNIOR HIGH SCHOOL addn., LOUISVILLE, KY. Jefferson Co., Bd. Educ., 618 W. Jefferson St., Louisville, Ky. Bids Dec. 13. CD 12/7.

Thomas Shields, 307 York St., Newport, Ky. Own Forces Approx. $504,000, 1st section, twenty-eight 1½ story bsmnt. HOMES, Joyce Ave., NEWPORT, KY. Edw. Beiting Jr., 1002 Monmouth St., Cincinnati, O., archt. Morlidge & Morlidge, 104 W. Fourth St., Cincinnati, O., engrs. CD 2/9.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Mich., Milford—BA 1/7—Village, Arvale Tipper, clk., 351 N. Main St., 350,000 gal. water tank with grading and foundations, 2,306 ft. 6 and 8 in. water mains. Plans deposit $20, refundable. Hubbell, Roth & Clark, Inc., 954 N. Hunter Bldg., Birmingham, engr.

▲ **Mich., Dearborn**—BA 1/24—Bd. Trustees Dearborn-Melvindale Disposal Auth., Dpt. Law, City Hall, Dearborn, Dearborn-Melvindale Disposal Incinerator. $1,500,000. Bids 6/21, rejected. CD 7/17, under LB.

BUILDINGS—BA

Mich., Wayne—SCHOOL—BA 1/7—Bd. Educ., Wayne Community Schools, Harris J. Wilson, secy., 3714 S. Wayne Rd., elementary school, Carlson and Glen Aves., elementary school, Glenwood Rd. and Treadwell Sts. Plans deposit $25 each. Yamasaki, Leinweber & Assocs., 103 W. Fifth St., Royal Oak, archts. CD 3/1.

Mich., Wyandotte—SCHOOL—BA 1/7—School Dist. No. 8, Ecorse Twp., 15010 McCann St., elementary school, Helen St., Ecorse. Plans deposit $25, refundable, Eberle M. Smith, Assoc., Inc., 153 E. Elizabeth St., Detroit, archt.

▲ **Ind., Bloomington**—TRAINING INSTITUTE—BA 1/10—Bd. Trustees Indiana University, at office J. A. Franklin, pres.-treas., Bloomington, general constr. of bldg. addn., plumbing and drainage sys., heating, ventilating and air-conditioning sys., elec. work, $1,500,000-$2,000,000. Plans deposit $25 each. Edward D. James, 122 E. Mich. St., Indianapolis, Zone 4, archt. Fennig & Weir, 811 Broad Ripple Ave., Indianapolis, Zone 40, mech. engrs. CD 3/22.

Mich., East Lansing—ENGINEERING—BA 1/15—State, Karl H. McDonel, secy., State Bd. Agriculture, Admin. Bldg., mechanics and mechanical engineering bldg., mechanical laboratory, Michigan State University. Plans deposit $50, refundable, Giffels & Vallet, Inc., L. Rossetti Associated Architects & Engineers, 1000 Marquette Bldg., Detroit, archts.-engrs.

Mich., Hastings—HOSPITAL—BA 1/15—Bd. Supervs. Barry Co., John W. Hewitt, chn., County Court House, Barry County Medical Care Hospital Facility, M-79 near Thornapple Home. Plans deposit $50. J. & G. Daverman Co., 924 Grandville Ave. S. W., Grand Rapids, archt. CD 9/17.

▲ **O., Kettering**—GYMNASIUM, etc.—BA 1/24—Bd. Educ., Kettering, gymnasium-health bldg. and cafeteria-library bldg. $1,077,000.

▲ **Ind., Peru**—HOUSING—BA On Or About 1/29—Base Procurement Office, Bunker Hill Air Force Base, construct and finance 680 family housing units, Armed Services Housing, Bunker Hill Air Force Base, near here, No. 12-617-57-50. $11,200,000. Plans deposit $100. CD 10/3, under LB.

Ill., Chester—HOUSING—BA About 3/1—Chester Housing Auth., Chester, 60 unit housing. $763,281. Verdell Hanner & Assocs., 21 E. Acton St., Woodriver, archts. CD 7/17.

BUILDINGS—SLC

O., Shaker Heights—OFFICE—Ohio Bell Telephone Co., 750 Huron Rd., Cleveland, Zone 15, soon lets contract 2 story, 37,000 sq. ft. office. $500,000. Nicholas Zajack, Hippodrome Bldg., Cleveland, Zone 14, archt. CD 10/4.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Dpt. Hys., Columbus, Zone 15,
O.—**V. N. Holderman & Sons, Inc.**, 890 Oakland Park Ave., Columbus, O., LB $682,613, est. $770,700 (5 bidders) Type T-71 and structures 5.655 mi. USR 25-(0.00) (4.45) 13.29, 1-963 (4), Proj. 486, Allen and Auglaize Counties; LB $4,464,560, est. $5,032,000 (4 bidders) Type T-71 and structures 11.212 mi. USR 25-5.05, 1-196 (6), Allen and Auglaize Counties;
O.—**John R. Jurgensen Co.**, 3535 Round Bottom Rd., Newtown, O., LB $1,610,022, est. $1,446,500 (2 bidders) Type T-35 5.317 mi. SR 125-0.00, F-151 (2), Clermont and Hamilton Counties;
O.—**Bethel, Scott & Bullock**, McArthur, O., LB $322,140, est. $351,900 (2 bidders) Type T-35 on B-20 and structure 1.645 mi. USR 68-23.31, 0.00, F-655 (20) Clinton and Green Counties;
O.—**Fischer Constr. Co.**, 4053 Clifton Ave., Cincinnati, O., LB $3,104,243, est. $3,262,000 (10 bidders) Type T-71 and structures 6.447 mi. USR 40-11-07, 1-1097 (3), Montgomery Co.;
O.—**H. H. Miller & Son**, R. D. No. 1, New Milford, O., LB $793,438, est. $1,016,000 (9 bidders) Type T-71 and structure 4.084 mi. USR 224-6.22, F-330 (3), Portage Co.;
O.—**The Peerless Constr. Co.**, 560 Rawson Ave., Fremont, O., LB $185,674, est. $204,700 (2 bidders) Type T-35 1.985 mi. SR 12-1.91, F-257 (2), Sandusky Co.;
O.—**Marshall C. Rardin & Sons, Inc.**, 2715 Mogadore Rd., Akron, O., LB $417,017, est. $414,800 (2 bidders) Type T-35, 4.418 mi. SR 619-(4.66-8.04), S-385 (4), Stark Co.;
O.—**The Thorpe Constr. Co.**, 109 N. Union St., Akron, O., LB $198,521, est. $193,200 (2 bidders) Type T-35, 1.237 mi. SR 82-6.13, F-444 (5), Summit Co.;
O.—**Northwest Materials, Inc.**, W. Edgerton St., Bryan, O., LB $136,513, est. $151,300 (1 bidder) Type T-35 and structure 1.529 mi. SR 15-(0.00) (2.03), S-1147 (3), William Co.; LB $225,918, est. $259,200 (1 bidder) Type T-35, 2.092 mi. USR 127-(6.10), (7.16), (8.54), (9.73), Williams Co.;
O.—**L. P. Cavett Co.**, 511 Shepherd Ave., Lockland, O., LB $627,145, est. $658,000 (2 bidders) Type T-35, 5.941 mi. USR 52-(7.84-13.29), Village of Manchester, Adams Co.;

O.—**Nelson T. Bahan**, 549 E. Court St., Urbana, O., LB $227,163, est. $245,300 (2 bidders) Type T-35 on B-119 and structure 1.218 mi. SR 55-(8.07)...(12.48), Champaign Co.;

O.—**The Frysinger Constr. Co.**, 3770 N. High St., Columbus, O., LB $685,532, est. $786,700 (7 bidders) Type T-35 and structures 5.861 mi. USR 42-(4.43-6.28) Clark and Madison Counties;

O.—**C. E. Edgington & Son**, 913 S. Main St., Findlay, O., LB $599,844, est. $693,700 (6 bidders) Type T-35 on B-119 and structures 1.786 mi. USR 30S-0.00, 28.90 (2.02-2.29), (3.48), (6.71), Crawford, Marion and Morrow Counties;

O.—**W. L. Johnson Constr. Co. & Assoc.**, P. O. Box 6668, Bexley Station, Columbus, O., LB $4,992,796, est. $5,417,700 (7 bidders) Type T-71 and structures 5.295 mi. SR 4-0.00, 20.50, City of Dayton, Greene and Montgomery Counties.

O.—**The Great Lakes Constr. Co.**, Box 2278, Brooklyn Station, Cleveland, O., LB $421,487, est. $401,200 (2 bidders) Type T-35 2.954 mi. SR 84-(0.43-1.44), Lake Co.;

O.—**S. E. Johnson Co.**, P. O. Box 29, Maumee, O., LB $816,526, est. $913,200 (3 bidders) Type T-35, 9.877 mi. USR 24-(0.00-9.51), Lucas Co.;

O.—**The McCourt Constr. Co.**, 720 Home Ave., Akron, O., LB $161,107, est. $162,600 (2 bidders) Type T-35 1.785 mi. SR 548-0.00, 21.36, Medina and Wayne Counties. Bids Dec. 11.

S. A. Ruebel Co., Ross Ave., St. Bernard, O. CA $134,000, est. $140,000, new street off Pippin Rd., 6,000 ft. concrete pavement, CINCINNATI; O. Larchmont Realty Co., 307 E. 4 St., Cincinnati, O.; James Wald & Assoc., 2565 Galbraith Rd., Cincinnati, O., engrs. Awarded Dec. 7. CD 7/27, under LB.

▲ **Morris Skilken & Co., Inc.**, 696 E. Broad St., Columbus, O. LB $2,217,242, general constr. terminal bldg., incl. taxiways, apron hangars, at Port Columbus, COLUMBUS, O. Total est. $3,200,000. City, City Hall, Columbus, O. Bids Dec. 11. CD 11/14.

Limbach Co., 851 Williams Rd., Columbus, O. LB plumbing at Port Columbus (Columbus, O.);

Piping Contractors, Inc., 58 N. Washington Ave., Columbus, O., LB $335,984, heating, ventilating, air conditioning, at Port Columbus (Columbus, O.);

Gustav Hirsch Organization, Inc., 1347 W. 5 Ave., Columbus, O., LB electrical work at Port Columbus, (Columbus, O.).

† **George W. Timmons Co.**, 7211 New Germany Rd., Columbus, O. LB $729,570, est. $412,000 (1 bidder) instrumentation for Bldg. 45, Research Facility/Test and Missile, Wright Patterson Air Force Base, ENG-15-029-57-19, DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Dec. 13. CD 11/1.

▲† **George W. Timmons Co.**, 7211 New Germany Rd., Columbus, O., LB $1,524,866, est. $1,661,430 (2 bidders) furnish equip. for Bldg. 45, Research Facility, Test and Missile, Wright Patterson Air Force Base, ENG-15-029-57-18, DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Dec. 12. CD 11/1.

▲ **Cloud & Alverness**, 125½ S. Main St., Bellefontaine, O., LB $2,244,681 (3 bidders) water sys. serving Hubbard and Liberty Twps., incl. 1 m. g. storage tank and two 500,000 gal. standpipes, WARREN, O. Comrs. Trumbull Co., Court House, Warren, O. Bids Dec. 12. CD 11/15.

▲ **ILLINOIS**—Ill. State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Material Service Corp., 300 W. Washington St., Chicago, Ill., LB $1,328,282, furnishing members for 49 prestressed concrete bridges on North Illinois Tollway. Bids Dec. 13. CD 11/26.

John Doherty Co., 9824 Genoa Ave., Chicago, Ill., CA $681,753, south side auxiliary outlet sewers, Contract 3B, Michigan Ave. and 68 St., CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 12/12, under LB.

▲ **Healy Bros. & Co.**, 47th and E. McCook St., Chicago, Ill. CA $1,079,700, Calumet Intercepting Sewer, Posen, Markham, Contr. 19-B, CHICAGO, ILL. Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. CD 11/19.

▲ **Hedges Constr. Co.**, 5915 N. Rogers Ave., Chicago, Ill. LB $2,782,975, Calumet Skyway Toll Bridge, Sec. 1-B-2, comp. struc., drainage, embankments, paving, etc. State St. to Keefe Ave., CHICAGO, ILL. City, City Hall, Chicago. Bids Dec. 18. CD 12/10.

John Erskine Co., 9259 Ularamie Ave., Skokie, Ill. CA $413,004, WW addn., PALATINE, ILL. Village, Village Hall, Palatine, Ill. Bids Nov. 26. CD 11/19.

WISCONSIN—State Hy. Comn., State Office Bldg., Madison,

Ryan Brothers Co., P. O. Box 206, Janesville, Wis. CA $688,174, grade, ballast and structures 9.089 mi. U. S. Hy. 51, South County Line-Mosinee Rd., Proj. F 05-3 (32), Contr. 1, Marathon Co. CD 12/14, under LB.

W. J. Lazynski, Inc., 4445 N. 124th St., Milwaukee, Wis., CA $274,233 (5 bidders), sewers in Easement W. Congress St., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids Dec. 4, awarded Dec. 11. CD 11/29.

MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. CA $901,301, grade separation on Detroit-Toledo Expressway crossing Detroit-Toledo and Ironton R.R. and Van Horn Rd. 1.25 mi. west of Trenton, BM X1 and BM B5 of 82-1-23 CIRO, Wayne Co. CD 11/28, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

L. W. Edison Co., 924 Floral Dr. S. E., Grand Rapids, Mich. CA $2,001,527, dual 24 ft. c. conc. 8.427 mi. US-131 relocation from 100 St. south to Wayland, Kent and Allegan Counties. CD 11/28, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Holloway Constr. Co.**, Livonia, Mich. LB $2,173,416, est. $2,350,000, paving 5.221 mi., 4 bridges, etc., BM 25031 C2-RO (SP 25-52), etc., Genesee Co.;

Mich.—**Darin & Armstrong, Inc.**, 2041 Fenkell St., Detroit, Mich. LB $1,018,564, est. $1,050,000, 0.682 mi. utilities alt. city sewers, water mains, lighting, water main tunnel, surf. service roads on Edsel Ford Expressway from near Mt. Elliott to near Frontenac, BI 8202A C2-00 (SP 82-68), etc., Wayne Co.;

Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich. LB $1,395,765, est. $1,530,000, single dual 24 ft. c. conc., 6 conc. 8.091 mi. on M-78 from west county line to M-47, M 76021 C1-RN, etc., Shiawassee Co.; LB $1,184,114, est. $1,300,000, 24 ft. c. conc. 5.966 mi. southbound lane and 4 ft. concrete base widening, 24 ft. c. conc. with 23 ft. b. conc. surf. on northbound lane of US-27 from M-57 north M 29011 C1-RN (SP 29-17), Gratiot Co.;

Mich.—**Hertel-Deyo Co. & C. E. Utterback Co.**, 5205 Division St., S., Grand Rapids, Mich. LB $874,496, est. $930,000, dual 24 ft. c. conc. 1.396 mi. on US-31 interstate route relocation M 24071 C1-RN (SP 23-15 M 24071 C2-Un (SP 24-15), Emmet and Cheboygan Counties. Bids Dec. 12. CD 11/29.

BUILDINGS—LB & CA

George E. Thurner, 2350 Victory Parkway, Cincinnati, O. Own Forces. $375,000, 4 story, bsmt., brick APARTMENT, Lucas Ave., CINCINNATI, O. Lee Firth, 3040 Madison Rd., Cincinnati, O., archt. Awarded Dec. 6. CD 3/2.

Roedeger Constr. Co., 1729 Superior Ave., Cleveland 14, O. CA Est. $400,000. PLANT addn., 4020 E. 116 St., CLEVELAND, O. Kroehler Mfg. Co., Naperville, Ill. H. K. Ferguson Co., 1783 E. 11 St., Cleveland 14, O., engr.

▲ **H. L. Vokes Constr. Co.**, 1000 Wayside Dr., Cleveland 10, O. CA Est. $1,000,000, design and construct OFFICE with 200-car parking, CLEVELAND, O. 2800 Euclid Building, Paul Marcus, pres., 2829 Euclid Ave., Cleveland 15, O. Awarded Nov. 15.

L. & J. Development Co., 3169 E. 80 St., Cleveland 4, O. CA Est. $300,000, 1 story, 40,000 sq. ft. brick, steel PLANT with offices in front, FAIRFIELD HEIGHTS, O. National Grill & Register Co., 3169 E. 80 St., Cleveland 4, O. CD 9/29/55.

Ohlonsky Constr. Co., Chardon, O., LB $438,700, general constr. HIGH SCHOOL addn., MENTOR, O. Bd. Educ., Mentor Ave., Mentor, O. Bids Dec. 5. CD 10/18.

▲ **Myers Y. Cooper Co.**, 2640 Erie Ave., Cincinnati, O. Own Forces. $2,000,000, (first sect.) 92 HOMES, 136 acre tract, Montgomery Rd., MONTGOMERY, O. J. Ward Franklin, 2640 Erie Ave., Cincinnati, O. archt. James Wald & Assoc., 2565 Galbraith St., Cincinnati, O., engrs. CD 10/11/55.

Steinle-Wolfe, Inc., 128 N. Jefferson St., Fremont, O. LB $684,341 (6 bidders) 30-bed HOSPITAL addn., PORT CLINTON, O. Magruder Memorial Hospital, Port Clinton, O. Bids Dec. 11. CD 11/14.

Brown & Matthews, Inc., 404 4th Ave., New York, N. Y. CA Est. $800,000, 1 story, 160x400 ft. PLANT with battery of kilns, to mfr. vitrified abrasive wheels, VAN WERT, O. Carborundum Co. (Bonded Abrasives Div.) Niagara Falls, N. Y.

Joseph M. Brickman Corp., 7830 W. Lawrence Ave., Chicago, Ill., LB $421,266, 1 story, brick Stephan Decatur Elementary SCHOOL, N. Sacramento and Lunt Aves., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Dec. 7. CD 11/28.

Wuellner-Manns, 101 Oak St, Alton, Ill. CA Est. $455,673, general contract two steel frames, brick, concrete elementary SCHOOL BLDGS., EAST ALTON, ILL. East Alton Bd. Educ., East Alton, Ill. Verdell, Hanner & Assocs., 21 E. Acton St., Woodriver, Ill., archts. Bids Nov. 20.

▲ **Wm. E. Schweitzer Co.**, 2207 Dodge Ave., Evanston, Ill., CA $3,422,000, 6 story HOSPITAL addn., EVANSTON, ILL. Evanston Hospital Assn.; 2650 Ridge Ave., Evanston, Ill. Burnham & Hammond, 52 W. Jackson Blvd., archts. Bids Dec. 4. CD 12/11, under LB.

Mazzucco Constr. Co., 4 E. Clinton St., Joliet, Ill., CA $407,000, 2 story, brick SUNDAY SCHOOL and GYMNASIUM, NAPERVILLE, ILL. St. Peter & Paul Church, 26 N. Ellsworth St., Naperville, Ill. Bids Nov. 28. CD 11/27.

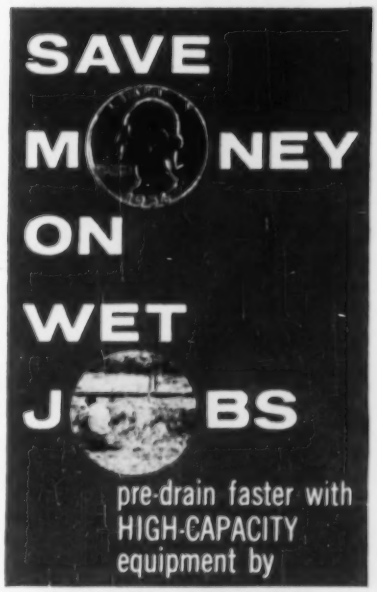
▲ **A. L. Jackson Co.**, 300 W. Washington Blvd., Chicago, Ill., CA $3,000,000, ACADEMY BLDG., Edens Hy., Lake, Laramie and Illinois Rd., WILMETTE, ILL. Loyola Academy, 6525 N. Sheridan Rd., Chicago, Ill. Bids Sept. 25. CD 9/18.

Permanent Constr. Co., 240 W. Capitol Dr., Milwaukee, Wis., CA $145,000, addn. to BOILER PLANT and WAREHOUSE, KAUKAUNA, WIS. Thilmany Pulp & Paper Co., Kaukauna, Wis.

Johnson Constr. Co., 677 Main St., Winona, Minn., CA $581,200, general contract Logan HIGH SCHOOL addn., alterations, LA CROSSE, WIS., Bd. Educ., La Crosse, Wis. Bids Nov. 29. CD 12/11, under LB.

T. S. Willis Co., 20 Milwaukee St., Janesville, Wis. CA $844,652, general contract UNION HIGH SCHOOL, WALWORTH, WIS. Bd. Educ., Walworth, Wis. Bids Nov. 14. CD 11/27.

Henry M. Martens Co., 2111 Woodward Ave., Detroit, Mich. LB $347,744, elementary SCHOOL, Rawsonville, BELLEVILLE, MICH. Bd. Educ., Van Buren Schools, 501 W. Columbia St., Belleville, Mich. Bids Dec. 3. CD 11/19.



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▲ Abe Green, 13324 West Seven Mile Rd., Detroit, Mich. Owner Builds. $10,000,000. 4,000 HOUSES and SHOPPING CENTER, STERLING, MICH. CD 10/2.

▲ Fluor Corp., P. O. Box 7930, Los Angeles 22, Calif., CA. Est. $3,000,000. 3,500 bbl. per day SULFORIC ACID ALKYLATION UNIT, TRENTON, MICH. Socony Mobile Oil Co., 26 Broadway, New York, N. Y.

C. H. Reisdorf & Sons, Inc., 9353 Freeland St., Detroit, Mich. CA $621,900. HIGH SCHOOL addn., AUDITORIUM and swimming pool addn., UTICA, MICH. Utica Community School Dist.; George F. Roberts, secy., Shelby and 21 Mile Rd., Utica, Mich. CD 11/26. under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 3 Missouri
STREETS AND ROADS
January 3 Missouri

† Tex., Fort Sam Houston—ELECTRIC SYS.—BA 1/3—U. S. Govt., Purch. & Contg. Office, Bldg. 370, Fort Sam Houston, San Antonio, emergency electric sys. $165,000. CD 9/16/54, under Public Buildings.

† Texas—BA 1/9—International Boundary & Water Comm., USA and Mexico, USA Sec. Box 1859, El Paso. Fex. constr. and install roller gates, hoists and cranes, acct. Andalucas Dam Proj., Spec. No. AN-6037-A, Vol. of 2. $500,000. Extended date. CD 11/29.

▲† Texas—BA About 1/18. U. S. Eng., Box 1229, Galveston; rectification and imprvs. to Brays Bayou from mouth of Lidstone Rd., Houston Ship Channel, Buffalo Bayou Flood Control Proj., CIVENG-41-243-57-39. $1,000,000-$3,000,000. CD 9/14.

† N. D., Minot—BUILDING, etc.—BA 1/23—U. S. Eng., 1709 Jackson St., Omaha, Neb., buildings, utilities, Phase II, Minot Air Force Base, Inv. 25-066-57-7. CD 12/13.

BUILDINGS—BA

▲ Tex., San Antonio—HIGH SCHOOL—BA 1/3—North East Independent School Dist., C. L. Camp, pres. Bd. Trustees, Lockhill-Selma Rd., Junior-Senior High School. $1,250,000. J. Fred Buenz, 4900 Broadway and H. Kellner, 406 Austin Hy., archts. R. C. Ripstein, Transit Tower, Karbach & Engel, 909 Maverick Bldg., engrs. CD 11/8.

Tex., Houston—SHOPPING CENTER—BA About 1/5—Center, Inc., c/o J. C. Epps, Jr., 12157 Kathryne Ct., Sect. 2, shopping center, Lakewood Shopping Center. $400,000. Emory S. White & Arne E. Engberg, 2017 S. Shepherd St., archts. CD 3/4/55.

Minn., St. Paul—STUDENTS HOUSING—BA 1/8—Regents of the University of Minnesota, C. A. Smith, purch. agt., Administration Bldg., Minneapolis, single students housing, 2-wing residence hall, St. Paul's Campus, $800,000. Plans deposit $25. Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, archts. CD 10/12/55.

▲ Tex., Dallas—OFFICE, etc.—BA 1/9—Southland Life Insurance Co., Southland Life Bldg., selected list of bidders, (1) 225,000 sq. ft. underground garage (2) 175,000 sq. ft. retail and shops (3) 400,000 sq. ft. office bldg. (4) 42 story office (5) 28 story, 600-room hotel. $25,000,000. Extended date. Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, Calif., engrs. Mark Lemmon, Thomas Bldg., Dallas and Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, Calif. archts. CD 11/21.

▲ Ark., Pine Bluff—HOUSING—BA 1/17—U. S. Eng., P. O. Box 867, Little Rock. 34 Capehart permanent family housing units to be constr. at Pine Bluff Arsenal Armed Services Housing Project. $500,000-$1,000,000.

Minn., Northfield—DORMITORIES—BA 1/17—Carleton College, B. Pollock, vice pres., Northfield, men's dormitory, women's dormitory, $500,000. Plans deposit $25 each bldg. CD 11/22 and 11/18/55.

▲ Tex., Austin—STATE OFFICES—BA 1/17—State of Texas, State Bldg. comn., Administration bldg., state offices bldg. $3,000,000. Extended date. Kuehne, Brooks & Barry, Perry-Brooks Bldg., Austin; Atlee B. & Robert M. Ayres, 342 W. Woodlawn St., San Antonio; Cato & Austin, 2401 LaBranch St., Houston; George L. Dahl, 2101 N. St. Paul St., Dallas; Stone & Pitts, 1872 Calder St., Beaumont, and R. Max Brooks, Perry-Brooks Bldg., Austin, archts. CD 12/11.

BUILDINGS—SLC

Ark., Ashdown—HOSPITAL—Little River Memorial Hospital, soon lets contract, 1 story, 19,000 sq. ft. air conditioned 30-bed hospital bldg. $415,000. Reinheimer & Cox, 413 National Bank Bldg., Texarkana, archts. CD 10/19.

HEAVY CONSTRUCTION—LB & CA

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul.

Alley Constr. Co., Faribault, Minn. CA $818,071. grade, crushed rock base, road-mixed bit. surf. 5.4 mi. between 0.4 mi. northwest of Dakota and 2 mi. southeast of LaMoille, Winona Co. CD 11/21, under LB.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul.

Albin—Dependable Surfacing Co., 115 Seventh Ave. S., South St. Paul, Minn. LB $176,490 (15 bidders) grav. base, plant-mixed bit. surf. 16.2 mi. between Sleepy Eye and jct. TH 19, 0.25 mi. E. of Fairfax, Brown, Nicollet and Renville Counties.

Minn.—Minnesota Valley Improvement Co., Granite Falls, Minn. LB $108,224 (12 bidders) grav. base, plant-mixed bit. surf. 9 mi. between Jct. T.H. 59 in Clarkfield and Jct. T.H. 23 in Yellow Medicine Co.

Minn.—Arcon Constr. Co., Mora, Minn. LB $410,496 (7 bidders) c. conc., b. conc. surf. 1.3 mi. West Broadway between Knox and Xerxes Aves. North, Hennepin Co.

Minn.—Alexander Constr. Co., 4641 Hiawatha Ave., Minneapolis, Minn. LB $220,539 (7 bidders) grav. base, road-mixed bit. base 3.7 mi. between 4 mi. south and 0.2 mi. south of T.H. 169 at Pengilly, Itasca Co. Bids Dec. 14. CD 11/28.

▲ IOWA—State H. Comn., Ames,

Iowa—Schmidt Constr. Co., Winfield, Iowa, LB $78,096, Group 2; LB $592,769, Group 3; LB $145,635, Group 4; LB $77,396, Group 6; LB $73,518, Group 10; LB $74,708, Group 11, bridges and culverts in Proj. No. IN-ING-853 (2), Polk Co.;

Iowa—Hobe Eng. Co., 2121 4 St., Sioux City, Iowa, LB $251,029, Group 5; LB $320,619, Group 7, bridges and culverts, in Proj. No. IN-ING-853 (2), Polk Co.;

Iowa—McCarthy Improvement Co., 602 Kahl Bldg., Davenport, Iowa, LB $109,654, bridges and culverts, U-831 (4); LB $358,358, bridges and culverts, UG-831 (5), both Scott Co.;

Iowa—A. Olson Constr., Co., 1225 Commercial St., Waterloo, Iowa, LB $223,808, bridges, culverts U-1052 (1), Johnson Co.;

Iowa—F. A. Moser, Farmersburg, Iowa, LB $100,098, bridges and culverts, I-ING-853 (2), Polk Co.;

Iowa—Arthur H. Neumann & Son, Inc., 514 Hubbell Bldg., Des Moines, Iowa, LB $105,145, Group 8, bridges and culverts, Proj. No. IN-ING-853 (2), Polk Co. Bids Dec. 11. CD 11/28.

▲ IOWA—State Hy. Comn., Ames,

Iowa—Fred Carlson Co., Decorah, Iowa, LB $435,978 c. conc. 2.145 mi. U-62 (8), Black Hawk Co.; LB $143,183, c. conc. 0.61 mi. U-23 (8), Marshall Co.;

Iowa—Slade Constr. Co., Fairmont, Minn. LB $102,863, rolled stone base and bit. 4.926 mi. C-1-57, Story Co.; LB $111,543, rolled stone base and bit. surf. 9.587 mi. C-3-57, Story Co.;

Iowa—Boswell Constr. Co., 218 Insurance Exchange Bldg., Sioux City, Iowa, LB $81,518, c. conc. 0.563 mi. F-2 (12), Woodbury Co.;

Iowa—Linnan-Gibson Constr. Co., Pocahontas, Iowa, LB $125,340, grading 9.672 mi. F-402 (7), Guthrie Co.;

Iowa—E. M. Duesenberg, Inc., Emery St., Mason City, Iowa, LB $462,777, grading 3.412 mi. IN-ING-853 (2), Polk Co. Bids Dec. 11. CD 11/28.

▲ Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, Iowa. CA Est. $1,000,000. 4 m.g. reservoir, ST. JOSEPH, MO. St. Joseph Water Co., Frank McAndrew, mgr., St. Joseph, Mo. (Correction—owner). CD 12/6, under CA.

▲† F. R. Comb Co., 2901 Aldrich Ave. S., Minneapolis, Minn., LB $1,328,033 (4 bidders) constr. buildings and POL facilities, two 2 story, 17,778 sq. ft. each dormitories, headquarters bldg., training bldg., infirmary and communications bldg., etc., Grand Forks Air Force Base, Inv. 25-066-57-5, GRAND FORKS, N. D. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Dec. 13. CD 11/21.

▲† Bushman Constr. Co., Fifth and Felix Sts., St. Joseph, Mo. LB $1,014,168, est. $1,034,903. Schedules 1, 2, 3 and 4, constr. earthwork and structures for Courtland Canal Sta. 2472 plus 48 to 2809 plus 00, Miller Canal Sta. 0 plus 00 to 456 plus 32.4 and laterals, wasteways and drains, Missouri River Basin Proj., Spec. DC 4786, KANSAS. Bureau Reclamation, Dpt. Interior, Superior, Kan. Bids Dec. 5. CD 10/24.

† Bushman Constr. Co., Fifth and Felix Sts., St. Joseph, Mo. LB $990,261, est. $938,370. Schedules 1 and 2, constr. earthwork and structures for Kirwin South Canal Sta. 0 plus 52, to 860 plus 50, laterals and drains, Missouri River Basin Proj., Spec. DC 4792, KANSAS. Bureau Reclamation, Dpt. Interior, Stockton, Kan. Bids Dec. 11. CD 10/24.

† Anderson Constr. Co., McAlester, Okla., CA $408,092, est. $400,000. 6.5 mi. access road to Eufala Dam, McIntosh Co., OKLAHOMA. U. S. Eng., Box 61, Tulsa, 2, Okla. Bids Nov. 20, awarded Dec. 12. CD 11/9.

▲ Vedal Constr. Co., c/o owner, CA $2,025,000. 135 mi. 12 in. products line looping line between Borger, Tex. and St. Louis, Mo.; $778,000, 66 mi. 12 in. products line between Borger, Tex. and Cassoday, Kan. TEXAS, MISSOURI, KANSAS. Phillips Petroleum Co., Bartlesville, Okla. CD 7/19.

▲ TEXAS—State Hy. Comn., Austin,

Tex.—R. N. Adams, P. O. Box 581, Kaufman, Tex., CA $1,052,816, grading, small structures 11.512 mi. Hy. US 75. Proj. I 549 (14) and I 832, Dallas and Ellis Counties;

Tex.—Olene Hanson, 4906 Griggs Rd., Houston, Tex., CA $682,129. grading, structures 4.239 mi. Hy. SH 73, Proj. I 1052, Chambers Co.;

Tex.—Strain Bros., P. O. Drawer 1631, San Angelo, Tex. CA $915,008, flexible base, hot mix b. conc. 2.461 mi. Hy. US 80. Proj. I 558 (17), Hudspeth and Culberson Counties;

Tex.—Uvalde Constr. Co., P. O. Box 10286, Dallas, Tex. CA $873,875, base, b. conc., c. conc. 3.87 mi. Hy. US 81, Proj. I 614 (15), McLennan Co. Grand total $3,523,828. Bids Dec. 11, awarded Dec. 13. CD 12/14, under LB.

▲ TEXAS—State Hy. Dpt., Austin,

Tex.—Austin Road Co., P. O. Box 1590, Dallas, Tex., LB $284,163, b. conc. and T & P overpass 0.839 mi. Hy. US 69 and 75. Proj. F 707 (1), FG 707 (2) and C 47-2-32, Grayson Co.;

Tex.—Baker, Bryson & Haner, Inc., Gorger, Tex., LB $185,976, grading, structures, base, surf. 12.922 mi. Hy. FM 1085 and 1657. Proj. R 1251-4-1, & 2186-1, Fisher Co.;

Tex.—John F. Buckner & Sons, P. O. Box 76, Cleburne, Tex., LB $344,959, flexible base, hot mix-b. conc. 2.229 mi. Hy. US 67. Proj. I 826 (16), Rockwall Co.;

Tex.—Gilvin-Terrill, Inc., P. O. Box 2288, Amarillo, Tex., LB $292,557, flexible base, three course surf. tr. 11.106 mi. Hy. US 62. Proj. S 8 (2), Crosby Co.;

Tex.—John T. Leslie, Bailey, Tex., LB $71,797, grading structures, base, surf. 4.753 mi. Hy. FM 2127, Proj. R 1848-2-1, Wise Co.;

Tex.—Moore Bros. Constr. Co., P. O. Box 35, Lufkin, Tex., LB $80,637, grading, structures, base, surf. 5.402 mi. Hy. FM 2251. Proj. S 1141 (1), Angelina Co.;

Tex.—T. R. Vardeman & Son, P. O. Box 485, Nacogdoches, Tex. LB $425,540, flexible base, one course surf. tr. 9.964 mi. Hy. US 84. Proj. S 2144 (1), Rusk Co. Bids Dec. 12. CD 11/20.

▲ TEXAS—State Hy. Comn., Austin,

Tex.—Austin Bridge Co. & Worth Constr. Co., P. O. Box 1590, Dallas, Tex., CA $1,185,776, flexible base, c. conc. (base) and hot mix b. conc. 1.475 mi. Hy. Loop 217. Proj. I 2101 (4), Tarrant Co.;

Tex.—Cage Bros. & T. C. Cage, 6959 San Pedro St., San Antonio, Tex., CA $1,673,022, flexible base, hot mix b. conc. 6.815 mi. Hy. U. S. 80, Proj. I 525 (5), Mitchell Co.;

Tex.—L. H. Lacy Co. & Norman L. Larson, 5630 Yale Blvd., Dallas, Tex., CA $1,137,104, c. conc. 4.948 mi. Hy. Loop 12. Proj. U 1089 (16) and UG 1089 (17), Dallas Co.;

Tex.—W. O. Pelphrey & Pelphrey-Farguar, Inc., 1412 Electric Bldg., Fort Worth, Tex., CA $2,169,484, flexible base, hot mix b. conc. 14.245 mi. Hy. U. S. 81, Proj. I 644 (14), Bell Co.;

Tex.—H. B. Zachry Co., P. O. Box 16188, San Antonio, Tex. CA $839,364. flexible base, hot mix b. conc. 16.048 mi. Hy. U. S. 80. Proj. F 439 (29), El Paso Co. Grand total $7,004,750. Bids Dec. 12, awarded Dec. 13. CD 12/17, under LB.

▲† Atlantic Gulf & Pacific Co., 15 Park Row, New York 38, N. Y., CA $1,759,567, dredging Port Aransas-Corpus Christi Waterway, channel to La Quinta and Turning Basin, Nueces and San Patricio Counties, CIVENG-41-243-57-27, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Oct. 31. CD 11/14, under LB.

† E. E. Farrow Co., Box 13186, Dallas 20, Tex., CA $911,973, ordnance aerophysics laboratory, 6 steam jet ejectors, barometric condensors and related facilities, Longhorn Odenance Works, Contr. NBy 1136, DAINGERFIELD, TEX. Bureau Yards & Docks, Dpt. Navy, U. S. Naval Station, New Orleans (Algiers), La. Bids Oct. 11. CD 10/24, under LB.

Bock Constr. Co., 2630 Ferris St., Dallas, Tex., LB $663,574, general constr. airways air servicing proj., incl. office, 2 hangars, at Love Field, DALLAS, TEX. City, City Hall, Dallas, Tex. (Southwest Airmotive Co., 8401 Cedar Springs St., Dallas, Tex., lessee). Koch & Fowler, 3900 Lemmon St., Dallas, Tex., engrs. CD 11/20;

George Linskie Co., Inc., 2608-A Inwood Rd., Dallas, Tex. LB $182,855, plumbing and heating, Love Field (Dallas, Tex.);

Electrical Contracting & Maintenance Co., 2726 Forest St., Dallas, Tex., LB $145,920, electrical work at Love Field (Dallas, Tex.)

▲† Rob. E. Mckee, General Contractor, Inc., Box 1748, Albuquerque, N. M. LB $1,054,000. airmen's mess hall and dormitories, Kirtland Air Force Base, ENG-29-005-57-48, ALBUQUERQUE, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Dec. 5. CD 11/1

Gulf-Tex Constr. Co., Box 2536, Houston, Tex., LB $356,176, water distr. sys. (1) HOUSTON, TEX. Harris County Water Control & Imprvt. Dist. 41, c/o Hilton & Coulson, engrs., 3821 Fannin St., Houston, Tex. Bids Nov. 27. CD 12/3;

Chicago Bridge & Iron Co., 5625 Clinton Dr., Houston, Tex., LB $171,200, steel elevated tank and ground water storage, (Houston, Tex.).

COLORADO—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Pioneer Constr. Co., Pueblo, Colo., CA $689,438, est. $700,000, grading, plant mixed surf., structures 9.288 mi. in Sterling, F 010-1(2), Logan Co. Bids Dec. 12. CD 12/4.

▲ NEW MEXICO—State Hy. Dpt., State Hy. Bldg., Cerrillos Rd., Sante Fe,

N. M.—Brown Constr. Co., 3225 Fourth St., N. W., Albuquerque, N. M. LB $1,558,595, est. $1,754,521. Road Forks-West, Proj. I 042-1 (3), Hidalgo Co. LB $2,059,515, est. $2,273,418. Hidalgo-Grant County line East, Proj. I 092-1 (4), Hidalgo and Grant Counties;

N. M.—Floyd Haake, Agua Fria, Santa Fe, N. M. LB $39,231, est. $284,740. Newman-north, Proj. F 020-1 (3), Otero Co. Bids Dec. 14. CD 12/6.

▲† V & N Constr. Co., Box 834, Lubbock, Tex. LB $1,633,280. 2 dining halls, 4 dormitories, Clovis Air Force Base, ENG-29-00-57-6, CLOVIS, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Dec. 13. CD 12/7

▲† Robert E. McKee, General Contractor, Inc., Box 1748, Albuquerque, N. M. and Box 562, El Paso, Tex. LB $1,195,742, est. $1,350,000. four dormitories, incl. all utilities, Biggs Air Force Base, ENG-29-005-57-54, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Dec. 12. CD 11/13.

▲† Ramsey-Leftwich, Box 559, Lubbock, Tex. LB $1,173,000. Schedule A, four 3 story airmen's dormitories, Walker Air Force Base, ENG-29-065-57-27, ROSWELL, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Nov. 28. CD 10/31.

BUILDINGS—LB & CA

D'Arcy Leck Constr. Co., 2838 Stevens Ave., Minneapolis, Minn. LB $549,960. (12 bidders) general constr., 1 story, 201x350 L-shaped ELEMENTARY SCHOOL, 81 St. and Humboldt Ave., BLOOMINGTON (P.O. MINNEAPOLIS), MINN. Bd. Educ., A. Moir, clk., Bloomington, Minn. Bids Dec. 13. CD 11/8.

▲ J. E. Dunn Constr. Co., 929 Holmes St., Kansas City, Mo. LB $1,231,052. general constr. four 4-story, 38x115 ft. DORMITORIES, 2 story, 102x191 ft. CAFETERIA and SERVICE CENTER, being south group on Hitt St., COLUMBIA, MO. Curators of University of Missouri, Dale O. Bowling, bus. mgr., Columbia, Mo. Bids Dec. 11. CD 12/4.

J. Louis Crum, Boone Bldg., Columbia, Mo. LB $638,876. plumbing and heating work (Columbia, Mo.).

▲ Miles Constr. Corp. 3407 San Fernando Rd., Los Angeles 65, Calif. and 222 Scott St., Little Rock, Ark. CA $20,861,606. construct and finance 922 HOUSING UNITS for airmen's and families and 613 HOUSING UNITS for officers and families Capehart Housing, JACKSONVILLE, ARK. Procurement Office, Little Rock Air Force Base, Jacksonville, Ark. CD 10/17, under LB.

▲ J. F. Pritchard & Co., 4625 Roanoke Parkway, Kansas City, Mo. CA Est. $5,000,000. 9,000 bbl. per day CATALYTIC REFORMER, AUGUSTA, KAN. Socony Mobile Oil Co., 26 Broadway, New York, N. Y. CD 4/18/47.

Manhattan Constr. Co., Manhattan Bldg., Muskogee, Okla. LB $919,311. 58x260 ft. CHEMISTRY and PHYSICS BLDG., STILLWATER, OKLA. Agricultural & Mechanical College, Stillwater, Okla. Bids Dec. 13. CD 12/5.

Beck Constr. Co., 1102 N. Columbia St., Tulsa, Okla. CA $504,000, est. $520,000. McArthur Elementary SCHOOL, 73 St. east, TULSA, OKLA. Bd. Educ., 410 S. Cincinnati St., Tulsa, Okla. Wolaver & Ryan, 1851 E. 71 St., Tulsa, Okla., archts. Awarded Nov. 27. CD 6/8/55.

▲† King Constr. Co., Box 39, Texarkana, Tex. LB $1,652,119. 6 concrete BUILDINGS, utilities, fencing, railway spur, Pantex Ordnance Plant, Inv. 292-57-19, AMARILLO, TEX. U. S. Atomic Energy Comn., Box 5400, Albuquerque, N. M. Bids Dec. 5. CD 11/28.

▲ Yarbrough Constr. Co., Box 851, Austin 65, Tex. CA $2,008,987. SUPREME COURTS BLDG., AUSTIN, TEX. State Building Comn., Main Admin. Bldg., Austin, Tex. Bids Nov. 26. CD 12/4, under LB.

Henry C. Beck, 617 First Natl. Bank Bldg., Dallas, Tex. LB Est. $750,000. HOSPITAL wing addn., laterations, DALLAS, TEX. Gaston Hospital, c/o E. O. Rushing, 3505 Gaston Ave., Dallas, Tex. Bids Dec. 5. CD 11/9.

Cowden Brothers, 411 S. Haskell St., Dallas, Tex. LB $729,000. OFFICE, DALLAS, TEX., State Farm Insurance Companies, 6131 Luther Lane, Dallas, Tex. Bids Dec. 7. CD 11/28.

▲† Jensen Constr. Co., 1203 Powhattan St., Dallas, Tex. LB $1,290,000. (6 bidders) BUILDINGS alterations Nos. 1, 2, 3 and 4, Veterans Admin. Hospital, DALLAS, TEX. Veterans Administration, Munitions Bldg., Waseh., D. C. Bids Dec. 18. CD 10/24.

▲ J. E. Morgan & Sons, Box 6029, Dallas, Tex. CA $1,686,200, OFFICE-BANK, DALLAS, TEX. Preston State Bank, c/o R. E. Alexander, Jr., archt., 3704 Abrams Rd., Dallas, Tex. Bids Oct. 30. CD 11/8, under LB.

▲ Butcher & Sweeney, 806½ Taylor St., Fort Worth, Tex., CA $2,399,100, est. $2,200,000. 5 story masonry CIVIL COURTS BLDG., Courthouse Square, FORT WORTH, TEX. Tarrant Co., Court House, Fort Worth, Tex. Bids Dec. 5, awarded Dec. 12. CD 12/7, under LB.

▲ Linbeck Constr. Corp., Box 13007, Houston, Tex. CA $1,650,000. four BUILDINGS, incl. (1) fine arts center (2) high school-auditorium (3) Junior High school (4) elementary school, HOUSTON, TEX. Kinkaid Preparatory School, 1301 Richmond St., Houston, Tex. Bids Nov. 2. CD 11/14, under LB.

▲ R. D. Kitchens Constr. Co., Box 3006, South Austin Station, Austin, Tex., LB $1,892,211, Group 1, COLLEGE BUILDINGS, LUBBOCK, TEX. Texas Technological College, Lubbock, Tex. Bids Dec. 11. CD 12/3.

▲ B M F P Constr. Co., 2010 Ave. C., Lubbock, Tex. CA $1,280,000. ELEMENTARY SCHOOL, AUDITORIUM, BOILER ROOM addn., LOVINGTON, N. M. Lovington Municipal Bd. Educ., School Dist. No. 1, Lea Co., Lovington, N. M. CD 12/6, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
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January 3 Nevada

Calif., Ontario—BA 1/2—City, City Hall, 225 S. Euclid Ave., Ely St. Outfall Sewer. $400,000. Plans deposit $25. Associated Engineers, 425 N. Laurel Ave., engrs. CD 9/27.

▲ Wash., Moses Lake—HANGAR—BA 1/15—Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Zone 4, two-place painting-facility hangar except for structural steel frame with concrete apron and yard paving, access road utilities. $3,000,000. Plans deposit $100. Extended date. Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle, Zone 1, archt. CD 11/16.

▲† Wash., Moses Lake—BA 1/29—U. S. Eng., City-County Airport, Walla Walla, 1 story, rein.-con. masonry, structural steel, 50,000 sq. ft. hospital with utilities at Larson Air Force Base, ENG-45-164-57-5. Plans deposit $100. Extended date. CD 12/7.

▲ California—BA 2/5—Bureau Reclamation, Dpt. Interior, Weaverville, constr. Trinity Dam, Central Valley Proj., Trinity River Div., Spec. DC 4824. CD 10/31.

BUILDINGS—BA

▲ Calif., Antioch—PLANT—BA 1/7—Crown-Zellerbach Corp., c/o Engr. Dpt., Airport Way, Seattle, Wash., precast concrete panels, structural steel frame tissue paper mfg. plant. $8,000,000. CD 10/30.

Wash., Bothell—SCHOOL—BA 1/7—School Dist. 46, Bothell, 36,000 sq. ft., 5 steel frame and frame bldgs. for elementary school, 21615 Tartarian Rd. $500,000. Plans deposit $50. R. H. Burkhard, 2120 S. E. 152 St., Seattle, archts. CD 6/25.

Wash., Seattle—SCHOOL—BA 1/8—Highline School Dist. 401, 253 S. 152 St., four 1 and 2 story, steel frame bldgs., 72,000 sq. ft. for Sunset Junior High School. $800,000. Plans deposit $50 for general. Steinhart, Theriault & Anderson, 1264 Eastlake Ave., archts. CD 11/14.

Calif., Livermore—SCHOOL—BA 1/14—Livermore Joint Union High School Dist., 6 and Maple Sts., Livermore Union High School addn. $592,683. Plans deposit $25. Anderson & Simonds, 2800 Park Blvd., Oakland, archts. CD 9/25.

▲ Wash., Seattle—HOSPITAL—BA 1/17—Missionary Sisters of Sacred Heart, c/o J. Graham & Co., archt., 1426 5 Ave., 7 story, 71,500 sq. ft. rein.-con. St. Frances Xavier Cabrini Hospital addn. $1,000,000. CD 5/19.

Calif., Los Angeles—PHYSICS BLDG.—BA 1/31—University of California, 405 S. Hilgard Ave., physics bldg.- conversion. $500,000. Plans deposit $125. CD 8/9/55.

HEAVY CONSTRUCTION—LB & CA

NEVADA—Directors Dpt. Hys., State Office Bldg., Carson City,

Jack B. Parson Constr. Co., Smithfield, Utah, CA $612,192 (7 bidders) constr. portion State Hy. Sys. from junction S.R. 18 (east of Tuscarora) to 15 mi. northerly, FAS Rte. 573, Control Sect. EL-28, Proj. No. S-573 (3), State Hy. Contr. 979, Elko Co. Bids Dec. 6. CD 11/13.

† Alton V. Phillips & Ward Constr. Co., 4055 21 St., W. Seattle, Wash. CA $847,585. Chief Joseph Dam Proj., constr. Brewster Flats pumping plants discharge lines and switchyards, Spec. DC 4766, WASHINGTON, Bureau Reclamation, Dpt. Interior, Bridgeport, Wash. Bids Nov. 20, awarded Dec. 12. CD 11/28, under LB.

▲† C. J. Montag & Sons, 7805 N.E. Halsey St., Portland, Ore., Carl Halvorson, Inc., 10626 S.W. Pacific Hy., Portland, Ore., Babler Brothers, Inc., 4617 S. Milwaukee Ave., Portland, Ore., McLaughlin, Inc., Ford Bldg., Great Falls, Mont., and Austin Constr. Co., 2930 4th St. S., Seattle, Wash., LB $29,475,397, est. $30,984,686 (3 bidders) powerhouse structures for Ice Harbor Dam in Walla Walla Co., CIVENG-45-164-57-16, WASHINGTON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Dec. 18. CD 10/10.

G. R. Leischner Constr. Co., 1201 W. 92 St., Seattle, Wash., LB $621,490 (5 bidders), expansion of Lake City sewage treatment plant, SEATTLE, WASH. City, County-City Bldg., Seattle, Wash. Bids Dec. 12. CD 11/16.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Calif.—Gibbons & Reed Co., 825 W. 9 North St., Salt Lake City, Utah. LB $4,605,488. (8 bidders) grading, surf. 6.9 mi. four-lane divided hy. as extens. of Sacramento Canyon Freeway, 25 mi. south of Dunsmuir, Shasta Co.,

Calif.—O. K. Mittry & Sons, 15905 S. Broadway, Gardena, Calif. LB $1,007,276. (11 bidders) grading, surf. 5.2 mi. US 4, Alt. between 0.7 mi. west of Spring Garden and Sloat, Plumas Co. Bids Dec. 12. CD 11/16.

▲† Joseph Bettancourt, 125 S. Linden St., South San Francisco, Calif. CA $1,650,000. electronic and electronic overhaul bldg., Naval Air Station, NBy 6881, ALAMEDA, CALIF. Dist. P. Wks. Office, 12th Naval Dist., San Bruno, Calif. Bids Oct. 31. CD 12/5, under LB.

▲ American Pipe & Constr. Co., Box 3428, Terminal Annex, Los Angeles, Calif. LB $8,492,547. (7 bidders) constr. siphons for Colorado River Aqueduct between Rice and Whitewater Sts., Spec. No. 504, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 303 W. 3 St., Los Angeles, Calif. Bids Dec. 13. CD 11/28.

▲ Peter Kiewit Sons Co., 345 Kieways Ave., Arcadia, Calif., LB $8,552,412 (4 bidders) Proj. 84, constr. relief drain, Slauson Ave., LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250

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Alcazar St., Los Angeles, Calif. Bids Dec. 14. CD 11/8.

Cal-Central Constr. Co., 7500 14th Ave., Sacramento, Calif., LB **$534,706** (10 bidders) constr. buildings, and other facilities for city corporation yard, on 24 St. Rd., SACRAMENTO, CALIF. City, City Hall, 9th and I Sts., Sacramento, Calif. Bids Dec. 13. CD 11/29.

BUILDINGS—LB & CA

Bell & Valdez Development Co., 1044 116 N.E. Bellevue, Wash. Day Labor, **$491,250**. 34 HOUSES: 164 S.E. and S.E. 7, BELLEVUE, WASH. CD 12/15/54.

† **J. P. Hopkins Co.**, Mercer Island, Wash., LB **$904,328**. (9 bidders) 66 unit family HOUSING at Fort Lawton, Inv. 57-12, SEATTLE, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Dec. 11. CD 12/7.

Ström Constr. Co., 2141 Fawcett Ave., Tacoma, Wash., CA **$502,463**, two DORMITORY BLDGS., TACOMA, WASH., College of Puget Sound, 1500 N. Warner St., Tacoma, Wash. Bids Oct. 31. CD 11/8, under LB.

▲ **G. H. Moen**, 516 S. 5 Ave., Yakima, Wash. LB $1,251,671. (3 bidders), general contract for 4 story CLUB BLDG., YAKIMA, WASH. Young Mens Christian Assn., Yakima, Wash. Bids Dec. 13. CD 11/26; **Rainer Mechanical Contractor**, 2702 E. 112 St., Tacoma, Wash. LB **$412,009**. (5 bidders) mechanical contract (Yakima, Wash.).

▲ **Salem School Dist.**, 1309 Ferry St., Salem, Ore. rejected bids Nov. 23, Waldo JUNIOR HIGH and Judson JUNIOR HIGH SCHOOLS, SALEM, ORE. LB **$2,716,260**. CD 11/29, under LB.

▲† **John E. Branagh & Son**, 42 LaSalle Ave., Piedmont, Calif. CA $1,559,200. general constr. Washington Twp. HOSPITAL addn., 1 story to present 2 story bldg. now under constr. Type 1 constr. rein.-con. near Niles, CENTERVILLE, CALIF. Washington Township Hospital Bd. Dirs., Washington Twp., Centerville, Calif. Bids Nov. 27, awarded Dec. 12. CD 12/6, under LB.

Herbert Goldsworthy, P.O. Box 710, Santa Monica, Calif. LB **$544,000**. Culver City HIGH SCHOOL addn., alterations, ART, and CRAFTS BLDG., AUTO SHOP BLDG., et al, CULVER CITY, CALIF. Culver City Unified School Dist., 4034 Irving Pl., Culver City, Calif. Joseph Estep, 236 24 St., Santa Monica, Calif., archt. Bids Dec. 7.

J. T. Cowan, 625 Belmont St., Fresno, Calif., CA **$500,000**. BOWLING CENTER, FRESNO, CALIF. Hayes-Hixon Co., c/o contractor.

▲† **Clarence Ward Co.**, 4323 E. Harvey St., Fresno, Calif. CA **$1,290,000**. permanent NAVAL FACILITY, 5 concrete block bldgs., 2 enlisted mens barracks, admin. bldg., subsistence bldg., shop bldg., and 10 one story service bldgs., NB 4570, POINT SUR, CALIF. Dist. P. Wks. Office, 12th Naval Dist., San Bruno, Calif. Bids Nov. 14, awarded Dec. 10. CD 11/23, under LB.

Cal-Central Constr. Co., 7500 14th Ave., Sacramento, Calif., LB **$900,000**. 2 story, 106x160 ft. STORE, 10th and K Sts., Class A constr. SACRAMENTO, CALIF. F. W. Woolworth Co., 405 Montgomery St., San Francisco, Calif. John J. Gould, 149 California St., San Francisco, Calif., engrs.

Bayshore Constr. Co., 508 16 St., Oakland, Calif. CA **$625,000**. 5 story WAREHOUSE and OFFICE remodeling (interior) 3 and Berry Sts., SAN FRANCISCO, CALIF. Phillips-Van Orden Co., 870 Brannan St., San Francisco, Calif.

Judson Pacific-Murphy Corp., 4300 East Shore Hy., Emeryville, Calif. CA **$812,195**. structural steel for I.B.M. PLANT, Phase No. 2, SAN JOSE, CALIF. International Business Machine Co., 99 Notre Dame St., San Jose, Calif. CD 11/27, under LB.

Craft Constr. Co., 2812 Sanguinetti Lane, Stockton, Calif., LB **$406,075** (7 bidders) 1 story, 60,000 sq. ft. rein.-con. WAREHOUSE and OFFICE, STOCKTON, CALIF. John Deere Plow Co., 651 Brannan St., San Francisco, Calif. Indenco, Inc., 2960 Merced St., San Leandro, Calif., engr.

Berringer & Botke, 1433 E. Main St., Santa Paula, Calif. LB **$739,700**, est. $770,000 (5 bidders) 5 story COUNTY OFFICE addn. at court house, VENTURA, CALIF. Bd. Suprvs. Ventura Co., Court House, Ventura, Calif. Bids Dec. 11. CD 11/27.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 16, 23 Ontario-

▲ **Que., Hull**—BA 2/5—City, City Hall, rein.-con. water reservoir; supply, install pumps; supply reinforcing steel; supply and install electric controls. $2,600,000. Lalonde, Girouard & Letendre, 7379 St. Hubert St., Montreal, engrs. CD 4/21/55.

BUILDINGS—BA

B. C., Vancouver—PARKING GARAGE—BA 1/7—Woodward Department Stores, Ltd., 101 W. Hastings St., car parking garage for 800-cars, 100 blk. Cordova St. $800,000. Robertson, Kolbeins, Teevan & Gallagher 279 W. Broadway, engrs. CD 10/18.

▲ **Man., St. James**—HOUSING—BA 2/7—Central Mortgage & Housing Corp., 870 Portage Ave., Winnipeg. Zone 10, finance and construct 430 housing units for Dpt. Defense. $7,000,000. Plans deposit $100. CD 7/9/51.

BUILDINGS—SLC

▲ **Ont., Toronto**—HOME FOR AGED—Salvation Army, 20 Albert St., soon lets contract 2 story, 180 bed frame, masonry Rest Home for Aged, poured concrete and concrete blk. fdn., $1,000,000. Marani & Morris, 1250 Bay St., archts. Karel R. Rybka & Assocs., Ltd., Federated Consultants Bldg., 209 Davenport Rd., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **Peter Kiewit Sons Co. of Canada, Ltd.**, 2182 W. 12 St., Vancouver, B. C., **Raymond International, Ltd.** and **B. C. Bridge & Dredging Co., Ltd.**, 1500 W. Georgia St., Vancouver, B. C., LB **$5,779,280** (2 bidders) approaches, ventilation bldgs. and fitting-out jetty for Deas Island Tunnel, near Ladner, BRITISH COLUMBIA. B. C. Govt., Parliament Bldg., Victoria, B. C. CD 3/22.

Canadian Westinghouse, Ltd., 355 Burrard St., Vancouver, B. C., LB **$325,620** (4 bidders) supply, install 26,000 kva vertical hydraulic generator for Ash River Development in Alberni Dist., BRITISH COLUMBIA. B. C. Power Comn., P. O. Box 500, Victoria, B. C.

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Upper Fraser Valley Constr. Co., Ltd., & A. C. McEachern, Ltd., Chilliwack, B. C., CA **$2,429,254**. 10.31 mi. Trans-Canada Hy., Vedder River-Chilliwack Sects. Bids Nov. 6, awarded Dec. 12. CD 11/20, under LB.

Forbes & Sloat, Ltd., 654 Union St., Fredericton, N. B. CA **$555,786**, ground improv., incl. grading, seeding, sodding, Camp Gagetown, FREDERICTON, N. B. Defence constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Awarded Dec. 7. CD 11/27, under LB.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto, Ont.—**U. P. Porter Co., Ltd.**, 936 Dominion Square Bldg., Montreal, Que., LB **$658,888** (4 bidders) grading, drainage 1.2 mi. Queen Elizabeth Way, northerly half of south approach to Burlington Bridge, from south end of bridge southerly, Contr. 56-190, Burlington;

Ont.—**John Gaffney Constr. Co., Ltd.**, 29 Downie St., Stratford, Ont., LB **$73,480**, hot mix paving 0.25 mi. Hy. 7, Spring Brook Creek structure, 4 mi. east of Kitchener, Contr. 56-194, Kitchener. CD 12/8/50.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto, Ont.—**J. N. Pitts, Ltd.**, 237 McRae Dr., Toronto, Ont., LB **$399,505** (4 bidders) grading, culverts, 1.9 mi. hy. 64 from Alban to Rutter and Murdoch River arch culvert, Contr. 56-181, Alban;

Ont.—**E. & E. Seegmiller, Ltd.**, 525 Wendell Ave., Kitchener, Ont., LB **$395,621** (12 bidders) granular base, hot mix paving 6.3 mi. Hy. 7 from Guelph westerly, Contr. 56-196, Guelph;

Ont.—**Dibblee Constr. Co., Ltd.**, 384 Bank St., Ottawa, Ont., LB **$108,092**, grading, culverts, 3.8 mi. Hy. 2 from 1.5 mi. east of Morrisburg to 2.9 mi. west of Aultsville, Contr. 56-198, Morrisburg;

Ont.—**Leo Alarie & Sons, Ltd.**, P. O. Box 140, Matheson, Ont., LB **$497,918** (6 bidders) grading, culverts, granular base 8.2 mi. Hy. 101 from Quebec boundary westerly, Contr. 56-191, New Liskeard. Bids Dec. 12. CD 11/28.

BUILDINGS—LB & CA

Poole Constr. Co. Ltd., 2402 2A St., Calgary, Alta. CA **$425,000**. 1 story, 250x300 ft. concrete block, WAREHOUSE, CALGARY, ALTA. Canada Safeway, Ltd., Calgary, Alta., J. A. Cawston, Mobil Oil Bldg., Calgary, Alta., archt. Awarded Dec. 12.

Cloverdale Constr. Co. Ltd., 734 12th St. N.W., New Westminster, B. C., LB **$928,421**. (8 bidders) 3 story, 75x190 ft., 60-bed rein.-con. HOSPITAL, HANEY, B. C. Maple Ridge Hospital Assn., Haney, B. C. Bids Nov. 27. CD 11/20.

▲ **Commonwealth Constr. Co. Ltd.**, 700 Taylor St., Vancouver, B. C. CA **$1,500,000**. cement-producing PLANT, 50-acre site, foot of No. 9 Rd., RICHMOND, B. C. Lafarge Cement of North America, Pemberton Bldg., Vancouver, B. C. Awarded Dec. 14.

Howden Constr. Co., Ltd., 1877 Marine Dr., North Vancouver, B. C. CA **$775,574**. 3 story, frame, masonry, Delbrook SENIOR HIGH SCHOOL, NORTH VANCOUVER, B. C. School Dist. 44, 230 W. Keith Rd., North Vancouver, B. C. Bids Oct. 30, awarded Dec. 11. CD 11/23, under LB.

Smith Bros. & Wilson, Ltd., 1267 Richards St., Vancouver, B. C. CA **$894,584**. 66 frame HOUSING units, Jericho area of VANCOUVER, B. C. Central Mortgage & Housing Corp., 2286 W. 12 St., Vancouver, B. C. Bids Oct. 16, awarded Dec. 11. CD 9/26.

Howe & Wilson, Ltd., 114 Maddock St., Victoria, B. C. LB **$878,790**, rein.-con. SOLARIUM, VICTORIA, B. C. Queen Alexandra Solarium, (Gordon Head), Victoria, B. C. Bids Dec. 5. CD 10/31.

Home Development Co., Ltd., 305 Paris Bldg., Winnipeg, Man. CA Est. **$603,000**. 52 HOUSING units, incl. water mains, sewers, etc., FORT WILLIAM, ONT. Central Mortgage & Housing Corp. Ltd., 870 Portage Ave., Winnipeg, Man. Bids Aug. 30. CD 8/22.

Thomas Fuller Contr. Co., Ltd., 199 Richmond Rd., Ottawa, Ont., CA **$597,989**, reconstr. POWER and PILOT PLANTS, Rideau Falls, Sussex Dr. for National Research Council, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Awarded Nov. 28.

Foundation Co. of Canada, Ltd., Wallace Terrace, Sault Ste. Marie, Ont. CA **$947,000**. FOUNDRY work, incl. new ingot mold foundry and demolition and relocation of work in old iron foundry northwest of Wilde Ave., SAULT STE. MARIE, ONT. Algoma Steel Corp., Ltd., 503 Queen St. E., Sault Ste. Marie, Ont. Awarded Dec. 11. CD 11/29/55.

▲ **Matthew L. Carroll, Ltd.**, 55 York St., Toronto, Ont. CA Est. **$1,200,000**. 90,000 sq. ft. WAREHOUSE and HEAD OFFICE BLDG., Vickers Rd. at Hys. 5 and 27, TORONTO, ONT. Power Supermarkets, Ltd., 118 King St. E., Toronto, Ont. Ying L. Hope & Assocs., 79 Huntley St., Toronto, Ont., mech. engrs. Bids Nov. 14, awarded Dec. 11. CD 11/8.

▲ **J. M. Leanson Ltee.**, 912 St. Louis St., Sherbrooke, Que., CA **$2,000,000**. CONVENT, DRUMMONDVILLE WEST, QUE. Rev. Sisters de la Presentation, Sherbrooke, Que. CD 7/31.

H. **Rafferty**, Jarry and Fabre Sts., Montreal, Que. Owner Builds. $700,000. 80 HOUSES, Montmorency St. between Michaud and Bon Pasteur Sts., LAVAL DES RAPIDS, QUE.

ALASKA

HEAVY CONSTRUCTION—LB & CA

† **Reed & Martin**, Fairbanks, Alaska, LB **$447,900**, est. $400,000 (3 bidders) operations bldg. addn., electric distr. sys., Campion Air Force Station, transmitter and receiver bldgs., TACAN, utilities, etc. Galena Airport, Inv. 57-33, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Dec. 11. CD 12/4.

† **Patti-MacDonald Co.**, Anchorage, Alaska, CA **$980,236**, Schedules 3, 4, 5 and 6, Chester Creek and Airport Heights Sewers, ANCHORAGE, ALASKA. Alaska B. Wks., Dpt. Interior, Juneau, Alaska. Bids Oct. 31. CD 11/12, under LB.
Sweta Constr. Co., Mountain View, Wash., CA $134,819, Schedule 2, Chester Creek and Airport Heights sewers, (Anchorage, Alaska).

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **GUATEMALA**—Departamento de Bienes Nacionales, Licitaciones y Asuntos Alemanes, 14 Calle 3-60, Zone 1, Guatemala City,

Compania Pan Americana, Guatemala City, Guatemala. LB **$1,062,990**. Proj. 26, three sections of Inter-American Hy. between Barberena and Asuncion Mita on Salvador end of Rd. Bids Dec. 18. CD 11/28.

▲ **Constructora Brillembourg Villegas Asociados, C. A.**, Edificio General Paez, Oficina 515, Esquina La Marron, Caracas, Venezuela, LB **$10,403,763**, constr. cofferdam sys. for Macagua No. 1 hydroelectric plant on lower Caroni River, VENEZUELA. Comision de Estudios Para la Electrificacion del Caroni, Torre Sur, Piso 6, Central Simon Bolivar, Caracas, Venezuela. CD 10/1

▲ **Ministerio de Obras Publicas**, Centro Simon Bolivar, Torre Sur, Caracas D.F., Venezuela, rejected bids of Aug. 15, constr. 5.6 mi. highway and railroad bridge across Lake Maracaibo's outlet to the sea, VENEZUELA. LB **$44,097,836**. Will re-advertise in February or March. CD 9/23 under LB.

▲ **VENEZUELA**—Ministry P. Wks., Centro Simon Bolivar, Torre Sur, Caracas, D. F.,
C. A. Constructora Occidental, Maracaibo, Estado Zulia, Venezuela, CA **$6,832,567**, 106 mi. asph. paving in Falcon State. Bids Sept. 20.

FOREIGN

BUILDINGS—BA

Iraq, Basrah—CONCRETE SILO—BA 5/30—Nathir Umari, pres., Grain Bd., Ministry of Economics, Mirjan Bldg., South Gate, Baghdad, 65,000 ton capacity concrete grain silo with working house; pier suitable for use by 10,000 ton ocean-going vessels; quey for river craft and barges; two houses for operating personnel; site improv. incl. railroad spurs, access area paving, electric, water, sewer lines, grading, sidewalks. Plans deposit ID 50,000. Tippetts-Abbett-McCarthy-Stratton, 5 Merlin-St., P. O. Box 42, Athens, Greece, and 62 W. 47 St., New York 36, N. Y., U.S.A., consult. engrs. adv. ENR 12/27.

HEAVY CONSTRUCTION—LB & CA

▲ **Neyrpic**, Paris, France, CA Est. **$2,000,000**, flood gate intakes and draught tube gates and screens, Kariba Hydro-Electric Proj. on Zambesi River, SOUTHERN RHODESIA, AFRICA. Federal Hydro-Electric Bd., Salisbury, Southern Rhodesia, Africa. CD 7/29/55.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲† **Moyer Brothers & Entracanales**, Madrid, Spain, LB **$2,438,543**, Alt. $2,446,031, (3 bidders) Group G facilities, incl. officers mess, power plant, P. W. maintenance, shop bldg. and infirmary, ROT-38. ROTA, SPAIN. Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N. W., Wash. D. C. Bids Oct. 31. CD 10/30.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ark., Jacksonville**—City, City Hall, constr. 3 billion gal. reservoir on Bayou Meto near city and constr. 1 m. g. sewage treatment plant. $1,000,000. Marion L. Crist Co., Union Life Bldg., Little Rock, consult. engr.

▲ **Calif., Indio**—City, water sys. improvs., incl. 2 m. g. reservoirs; booster pumps; 48,000 ft. 8- to 16-in. transmission lines; 50 fire hydrants. $1,045,000. Boyle Engr. Co., 3913 Ohio St., San Diego, consult. engr.

▲ **Calif., Nevada City**—City of Grass Valley, City Hall, Grass Valley and City of Nevada City, City Hall, Nevada City, constr. rock Creek Dam and water supply sys. near Grass Valley. $1,400,000.

▲ **N. Y., Buffalo**—City, Dpt. P. Wks., 4 m.g. storage tank and booster pump station at Kensington tower site, $500,000; 16 in. water line in E. Delavan Ave. from Main to Wyoming Sts., $300,000; pipe extens., $200,000.

▲ **Que., Drummondville**—City, City Hall, 3 m.g.p.d. capacity filtration plant, along Riviere St., Francoise. $1,000,000. Cote, Lemieux, Carignan & Bourque, 144 rue Vimy N., Sherbrooke, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Calif., Richmond**—City Council, City Hall, voted $8,000,000 bonds Dec. 11, sewerage and sewage disposal plant. CD 8/2.

▲ **Calif., Vallejo**—Vallejo Sanitation & Flood Control Dist., 450 Ryder St., sewage disposal plant. $1,750,000. Fred Lange, c/o owner, engr. CD 6/14/54.

▲ **Ill., Bellwood**—Village, Village Hall, storm sewers and booster station, E. Mannheim Rd. $1,500,000. Edwin Hancock Eng. Co., 1509 W. Jackson Blvd., Chicago, consult. engr.

▲ **Ind., Decatur**—City, Robert Cole, mayor, sewage disposal plant. $529,000; sewer ducts, $460,000. Consoer, Townsend Assoc., 360 E. Grand St., Chicago, Ill., consult. engrs. CD 5/12/54.

Iowa, Cedar Rapids—City, City Hall, sanitary sewer project, incl. lift station, high pressure sewer lines, interceptor sewer. $960,985. H. R. Green Co., 417 First Ave. S.E., consult. engr. CD 12/23/55.

▲ **Minn., St. Paul**—City, G. M. Shepard, engr., City Hall, constr. Battle Creek Trunk Sewer, sanitary sewer outlet to sewage disposal plant, storm sewer outlet to Mississippi River, southeast section of city north of the river. $1,100,000. Toltz, King, Duvall, Anderson & Assocs., 1509 Pioneer Bldg., St. Paul, consult. engrs., to go ahead in 1958; constr. Parkway Drive Branch of Belt Line sewer, 12- to 30-in. sewer pipe, also pumping station and c.i. pipe force main, $127,000. Banister Eng. Co., 1549 University Ave., consult. engr.; bids within a month; constr. 4 relief sewer projs. in 1957, incl. Hamline-Fairmont system, 12- to 48-in. pipe $177,000, Wheeler Ave. sewer, 12- to 48-in. $180,000, Albemarle-Rice Sys., 21- to 54-in. $158,000, Payne Ave. sys., 27- to 66-in. $345,000. G. M. Shepard, city engr. CD 11/9/53.

Mo., Higginsville—City, sewage plant. $521,000.

Neb., Kearney—City, sewers, sewage plant. $554,362. Henningson, Durham & Richardson, Inc., 2962 Harney St., Omaha, consult. engr.

▲ **Pa., Enola**—East Pennsboro Twp., 243 W. Columbia Rd., Enola, trunk and lateral sewers, pumping station, force mains, sewer treatment plants in Summerdale and Enola. $2,000,000.

▲ **Utah, Salt Lake City**—Salt Lake City Corp., Roy McLeese, city engr., City-County Bldg., plans by Templeton & Linke, 500 Dooly Bldg., sewage disposal plant, near 1250 W. 15 St. N., trunk line on Redwood Rd. to 21st South. $6,000,000. Clyde C. Kennedy, 604 Mission St., San Francisco, Calif., consult. engr. CD 6/6.

▲ **Va., Hopewell**—City, City Hall, sewage treatment plant. $1,100,000. R. Stuart Royer & Assocs., 15 W. Cary St., Richmond, consult. engrs. CD 11/9.

▲ **Sask., Regina**—City, City Hall, 8 sewage lagoons outside city. Recommended in engineers report. $4,275,000. Stanley, Grimble, Roblin, Ltd., 11605 Jasper Ave., Edmonton, Alta., and James F. MacLaren Assocs., Ltd., 321 Bloor St. E., Toronto, Ont., consult. engrs. CD 1/4/55.

BRIDGES

▲ **O., Columbus**—City, City Hall, Third St. viaduct. $6,000,000. Alden E. Stilson & Assocs., 245 N. High St., consult. engrs. Robert E. Werner, c/o owner, city engr. CD 1/18/45.

▲ **Pa., Pittsburgh**—Bd. Comrs., Allegheny Co., County Office, Glenwood Bridge and approaches over Monongahela River at Hazelwood, steel on concrete substructure. $8,000,000.

STREETS AND ROADS

Neb., Omaha—Douglas Co., Court House, widen to four-lanes and paving work, 72 St. from Pacific to Grover Sts. $500,000. Wm. Green, co. engr.

Tex., Houston—Cit.;, City Hall, new Major East-West Artery, new street connecting Elgin with Beaulah St., opening, widening, surf. $750,100. Lockwood & Andrews, 1010 Waugh St., consult. engrs. CD 2/2.

▲ **WASHINGTON**—State Hy. Comn., Olympia, **King, Pierce and Snohomish Counties**—65 m. freeway from Tacoma to Everett. $194,000,000. To go ahead in 1957. W. A. Bugge, state hy. dir.

EARTHWORK, WATERWAYS

▲† **California**—U. S. Eng., 1209 8th St., Sacramento, Virginia Point Dam and power project on Merced River at Horseshoe Bend. $50,000,000. ($75,000 appropriated for investigation).

▲ **Calif., Martinez**—Contra Costa Flood Control Dist., c/o County Clerk, Court House, defeated bonds Dec. 4, waterways improvs., Zone 3B, Contra Costa Co. $9,875,000. CD 10/23.

▲ **Vermont**—U. S. Eng., 150 Causeway St., Boston, Mass. Townshend Dam, West River, north of Brattleboro. $22,000,000 ($831,000 appropriated).

AIRPORTS

▲† **Ala., Brewton**—JET AIR BASE—Sixth Naval Dist., Naval Base, Charleston, S. C., plans by Reynolds, Smith & Hills, 227 Park St., Jacksonville, Fla.; jet air base. $40,000,000. Thos. B. Bourne & Assoc., Dupont Circle Bldg., Wash., D. C., consult.-engrs.

LATIN AMERICA

▲ **Mexico, Mexico City**—BARNS, SHOPS—Servicio de Transportes Electricos, Mexico City, plans tram barns and repair shops. $2,400,000 (both).

FOREIGN

▲ **British Guiana**—PLANT—Aluminum Ltd., Sun Life Bldg., Montreal, Que., alumina production plant near Mackenzie. $33,000,000.

PUBLIC BUILDINGS

Calif., Etna—SCHOOLS—Etna Union High School Dist., c/o Supt., Etna, voted bonds, schools. $966,000.

▲ **Calif., Garden Grove**—SCHOOLS—Alamitos School Dist., 12012 S. Magnolia Ave., voted $450,000 bonds Dec. 4, schools. To be augmented by $2,900,000 grant from state. CD 9/13.

Calif., Grand Terrace—SCHOOL—Terrace Union School Dist., Grand Terrace, plans by Herman O. Ruhnau, Mission Inn Rotunda, Riverside, part 2 story, 24,000 sq. ft. reinforced brick school plant, Mt. Vernon and DeBerry Sts. $500,000.

▲ **Calif., Marysville**—HIGH SCHOOL—Marysville Union High School Dist., c/o Supt., 18th and B Sts., high school, 50-acres site, at Linda, 2 mi. south of here. $1,800,000.

▲ **Calif., Menlo Park**—SCHOOLS—Portola Elementary School Dist., 775 Portola Rd., bond election Feb. 14, SCHOOLS. $1,000,000.

▲ **Calif., Placerville**—SCHOOLS—El Dorado Co. High School Dist., c/o Supt. Placerville, bond election Jan. 30, schools. $1,200,000. CD 6/22/54.

▲ **Calif., Redlands**—SCHOOLS—Redlands High School Dist., 653 E. Fern Ave., P.O. Box 279, voted $4,290,000 bonds Nov. 27, schools.

▲ **Calif., Santa Ana**—HOSPITAL—Orange Co., Court House, plans by Wildman & Faulkner, Spurgeon Bldg., 6 story main bldg., Orange County General Hospital. $5,605,000. CD 11/26.

Calif., Santa Ana—LIBRARY—Santa Ana City Council, City Hall, voted bonds Nov. 6, public library, parking area, landscaping and fixtures and equip. $700,000. CD 9/26.

▲ **Calif., San Diego**—GYMNASIUM, etc.—State Div. Architecture, 1120 N. St., Sacramento, men's gymnasium and pool, $915,000; chemistry-geology bldg., $2,210,000. To go ahead 1957-58.

▲ **Calif., San Francisco**—OFFICE—State Div. Architecture, 1120 N. St., Sacramento, 7 story, 108,000 sq. ft. State Compensation Insurance Fund office. $3,500,000. Bids in June.

▲ **Calif., Santa Barbara**—SCHOOLS—Santa Barbara School Dist., Santa Barbara, bond election Feb. 5, schools. $10,800,000. CD 5/27/52.

▲ **Calif., Stockton**—HOUSING—San Joaquin Co. Housing Auth., 2436 Bellevieww St., plans by Howard Bissell, 41 N. Hunter St., 340 unit low rent housing units, Stockton and Thornton, $3,500,000. Bids March 1957. Ellis Eckland, 41 N. Hunter St., engr. CD 9/19.

Colo., Cherry Creek (near Denver)—SCHOOL—Bd. Educ., Cherry Creek Dist. No. 5, 4801 Boston St., voted bonds Nov. 29, elementary school. $750,000.

Colo., Denver—OFFICE—City and Denver Co., Bd. Water Comrs., City and County Bldg., plans by Gordon D. White & Charles N. Overholt, 615 Columbine St., remodel library bldg. into office. $500,000.

▲ **Colo., Englewood**—SCHOOLS—Arapahoe County School Dist. 1, Englewood, bond election Jan. 14, schools, $2,500,000. CD 12/4/53.

Conn., Bloomfield—TOWN HALL—Town, constr. town hall. $750,000.

Conn., Guilford—SCHOOL—Town, plans by Gordon MacMasters, 151 Court St., New Haven, elementary school, Maupas Rd. $500,000. CD 7/9.

▲ **Conn., Hartford**—SCHOOL—Town, Town Hall, high school to replace Hartford Public High School, $4,500,000.

▲ **Conn., Meriden**—HIGH SCHOOL—Town, Meriden, East Side Junior High School. $1,700,000.

▲ **Conn., Wallingford**—SCHOOLS—Town, Town Hall, West Side Junior High School. $1,700,000 East Side Junior High School, N. Elm St. $1,800,000.

▲ **Ga., Atlanta**—SCHOOLS—Fulton Co. Bd. Educ., Courthouse, $3,000,000. bond election Jan. 15, schools. CD 6/20/55.

Kan., Pauline—SCHOOL—Bd. Educ. plans by Glover & Newcomb, 3101 Huntoon St., Topeka, school, $500,000.

Ky., Owensboro—HOSPITAL—Owensboro-Daviess County Hospital, Hospital Court, plans by Otis & Grimes, 312 Tyler Bldg., Louisville, 4 or 5 story hospital addn. $500,000.

Mass., Holyoke—SCHOOLS—City, William R. Peck, supt. Schools, elementary school, Cherry St. and Holmstead Ave.; elementary school, Westfield Rd. and Holmstead Ave. $700,000.

Mass., Norwood—SCHOOLS—Town, John B. Kennedy, genl. mgr., Municipal Bldg., 2 elementary schools, $700,000. CD 1/20/53.

Mich., Caro—SCHOOL—Village District, Clayton V. Hamilton, secy., plans by H. E. Beyster & Assoc., Inc., 700 Griswold Bldg., Detroit, Zone 26, high school, Hooper St. $900,000.

Mich., Coldwater—HOSPITAL—State, A. N. Langius dir. State Bldg. Dpt., Lansing, plans by Harley, Ellington & Day, 153 E. Elizabeth St., Detroit, Zone 1, General and Receiving Hospital, State Home & Training School. $750,000. CD 2/6/53.

Mich., Flint—SCHOOL—Bd. Educ., Bentley School Dist., 1223 Delsey Rd., plans by S. A. Nurmi & Assoc., Inc., 1669 N. Chevrolet Ave., Bentley High School. $500,000.

Minn., Lake City—SCHOOL—Bd. Educ., LeRoy Wickstrom, clk., defeated proposal Dec. 7 to authorize $1,475,000 bond issue for constr. of an elementary school and high school. CD 12/5.

Mo., Independence—SCHOOL—Bd. Educ., $850,000 bond election Jan. 22, school. Edward Fuller, 701 E. 14 Ave., Kansas City, Mo., archt.

▲ **Mo., Joplin**—SCHOOLS—Bd. Educ., $1,500,000 bond election Feb. 19, elementary school, $400,000, 2 school addns., $1,100,000, Peterson & Mantel; 1103 E. Armour Blvd., Kansas City, Mo., archts. CD 11/8.

▲ **Mo., Overland** (St. Louis 14 P.O.)—SCHOOL—Ritenour Consolidated School Dist., Wendell L. Evans, supt. schools, 9120 Bristol Ave., voted $2,000,000 bonds Dec. 4, 2 schools, high school addn. CD 11/28.

▲ **Mo., University City** (St. Louis 5 P.O.)—SCHOOL—School Dist. of University City, Bd. Educ., Dr. Robert L. Gilchrist, supt. schools, 6701 Delmar Blvd., defeated $3,875,000 bonds Dec. 4, schools, addns., improv. CD 10/15.

▲ **N. J., Dover**—HOSPITAL—Bd. Trustees, Dover General Hospital, Jardine Ave., constr. Dover General Hospital addn. $1,000,000. CD 12/16/53.

N. J., Rahway—SCHOOL—Bd. Educ., plans by Katz & Metsky, 875 Broad St., Newark, and Alex Merchant, 1 Elm Row St., New Brunswick, Roosevelt School addn. $700,000.

▲ **N. J., Trenton**—SCHOOLS—Hamilton Twp. Bd. Educ., 2069 Greenwood Ave., elementary school Mercerville Hamilton Sq. area, $500,000; Hamilton High School addn., $344,000; high school (conversion of Steinert School), $344,000.

▲ **N. Y., Middleport**—SCHOOL—Royalton-Hartland Central School, plans by Duane Lyman Assoc., 505 Delaware Ave., Buffalo, elementary school at Gasport, and school addn. at Middleport, $2,370,000. CD 7/12/46.

▲ **O., Columbus**—HIGH SCHOOL—Bd. Educ., 270 E. State St., plans by David Schackne, Jr., school archt., 3181 Polley Rd., 1 story, 710 ft. long Junior High School. $1,000,000. Bids early in year. CD 9/19.

▲ **O., Kent**—DORMITORIES—State Dpt. P. Wks., State Dpts. Bldg., Columbus, 2 womens dormitories; 2 mens dormitories, Kent State University. $5,000,000.

Pa., Phila.—GARAGE—Phila. Parking Auth., 1025 Chestnut St., parking garage (conversion of dept. store bldg.), 11 and Market Sts. $500,000.

R. I., Woonsocket—SCHOOLS—City, School Comm., City Hall, two new elementary schools, one in East Woonsocket. $700,000. Constr. in 1957. CD 10/27/44.

▲ **Tex., Big Spring**—HIGH SCHOOL—Big Spring Independent School Dist., Big Spring, plans by Atcheson, Atkinson & Cartwright, Sanford Bldg., Senior High School. $1,250,000.

Tex., Odessa—VOCATIONAL—Odessa College, Bd. Regents, Odessa, vocational bldg. $792,000. CD 2/3/55.

▲ **Tex., Plainview**—HOSPITAL—General Hospital, c/o Dr. Roy Roberts, chn. Bldg. Comn., Plainview, plans by Wyatt C. Hedrick Co., 1200 T & P Bldg., Fort Worth, 100-bed masonry hospital. $1,500,000.

Tex., Stephenville—HIGH SCHOOL—Stephenville Independent School Dist., J. C. Helms, supt. Schools, Stephenville, plans by Wyatt C. Hedrick Co., 1200 T & P Bldg., Fort Worth, 1 story brick, tile, concrete high school. $600,000.

▲ **Wash., Auburn**—YOUTH DIAGNOSTIC and TREATMENT CENTER—State Dpt. Institutions, Olympia, youth diagnostic and treatment center, Federal Way, $2,500,000. Work next year.

▲ **Wash., Seattle**—HOSPITAL—State Dpt. Institutions, Olympia, hospital unit at Fieland Sanatorium for care of retarded children, $2,335,000. Work next year.

▲ **Wis., Appleton**—SCHOOL—Bd. Educ., Appleton, plans by R. N. Le Vee & Assocs., 1000 W. College Ave., Junior High School. $1,000,000.

Wyo., Riverton—SCHOOL—Bd. Educ., School Dist. No. 25, plans by Karl Kriesmark, archt.-engr., 722 S. Center St., Casper, Junior High School. $500,000.

▲ **Alta., Edmonton**—GYMNASIUM, etc.—Alberta Dpt. P. Wks., Parliament Bldgs., gymnasium, $860,000; rink, $1,300,000; swimming pool, $490,000, at University of Alberta. Planned for 1958.

Ont., Barriefield—TRAINING—Defense Constr. (1951), Ltd., 56 Lyon St., Ottawa, plans by Fisher & Tedman, 623 Sherbourne St., Toronto, 2 story, partial bsmnt., and partial third floor, "U" shaped training bldg.; structural steel frame, constr. at Barriefield Army Camp. $650,000. Wallace, Carruthers & Assocs., Ltd., 92 Yorkville Ave., Toronto, consult. engrs.

▲ Ont., Ottawa—TECHNICAL TRAINING SCHOOL—Dpt. P. Wks., Parliament Bldgs., Toronto, technical training school, west of Champlain Bridge. $2,000,000.

Ont., Toronto—FEDERAL—Dpt. P. Wks., Hunter Bldg., Ottawa, federal bldg., Yonge and Charles Sts. $500,000.

Que., Hull—SCHOOLS—LaCommission Scolaire de Hull, Hull, plans by Rene Richard, 196 Fontaine St., school, Paroisse du Tres-Saint Redemgteur, $500,000. Bids in January.

COMMERCIAL BUILDINGS

▲ Ala., Birmingham—RESEARCH—Medical College of Ala., 1919 7 Ave. S., science research bldg. $2,000,000.

Calif., Bellflower—DWELLINGS—Corey Medvin, 5020 Rodeo Rd., Los Angeles, plans by Olsten Drafting Service, 10236 Lakewood Blvd., Downey, 57 frame, stucco dwellings, Clerk Ave. and Rosser St. $600,000.

▲ Calif., Los Angeles—HOSPITAL—Cedars of Lebanon Hospital, 4833 Fountain Ave., expand cardiorespiratory, radiation therapy and admin. dpts., new Rehabilitation Center, Institute of Nuclear Medicine, 100-bed convalescent hospital, psychiatric center, living facilities, 2-level parking bldg. $6,000,000. CD 9/3/52.

▲ Calif., North Rialto—SHOPPING CENTER—Micawey, Inc., 2201 Arrowhead Ave., San Bernardino, plans by Underhill & Wagner, 4313 Leimert Blvd., Los Angeles, 128,000 sq. ft. shopping center, Riverside and Baseline Aves. $1,580,000.

Calif., Petaluma—SHOPPING CENTER—O. H. Pock & Assoc., 100 Ross Circle, Oakland, 111,300 sq. ft. 5-unit shopping center, Douglas St., parking area for 500 cars. $550,000.

▲ Calif., South Whittier—DWELLINGS—Bradley Estates, Inc., 101 N. Doheny Dr., Beverly Hills, plans by C. G. Olsten Drafting Service, 10236 S. Lakewood St., Downey, 83 frame, stucco dwellings, Tract 18586. $1,500,000.

▲ Conn., Hartford—HOSPITAL WING—St. Francis Hospital, 114 Woodland St., plans by York & Sawyer, 201 Park Ave., New York, N. Y., hospital wing. $3,000,000.

▲ Conn., Huntington—HOUSES—Berkshire Builders, Inc., Brookfield, 150 houses, Judson St. and Buddington Rd. $1,500,000.

Conn., Torrington—HOSPITAL—Charlotte Hungerford Hospital, Litchfield St., plans by Crow, Lewis & Wick, 200 Fifth Ave., New York, N. Y., enlarge, modernize hospital. $500,000.

▲ Conn., Wethersfield—SHOPPING CENTER—Thomas P. Tracey, 695 Wolcott Hill Rd., shopping center, Silas Deane Hy. 50+ acre site. $1,000,000.

▲ D. C., Wash.—DORMITORY—Georgetown University, 37th and O Sts. N. W., plans by Walton & Madden, 3510 Rhode Island Ave., Mt. Rainier, Md., constr. men's dormitory. $2,000,000.

D. C., Wash.—LEGATION—Swiss Legation, 2900, 3007 and 3215 Cathedral Ave. N. W., constr. legation bldg., 2900 Cathedral Ave. N. W. $600,000.

▲ Fla., Bal Harbour—HOTEL—Melvin G. Rubel, pres., One Bal Harbour, Inc., c/o Norman M. Giller & Assocs., archts., 420 Lincoln Rd., Miami Beach, hotel, on 375 ft. of ocean front 96 St. and Collins Ave. $6,000,000.

Ill., Chicago—CHURCH—St. Anthony's Parish, 218 E. Kensington Ave., plans by Uda Koerner, 7501 S. Cottage Grove Ave., 1 story church, 115th and Indiana Ave. $500,000.

▲ Ill., Harvey—HOSPITAL—Ingalls Memorial Hospital, 155th St., plans by Wm. W. Benn & Assocs., 7 S. Dearborn St., Chicago, 3 story, bsmnt. hospital addn. $1,450,000.

Ind., Anderson—DORMITORY—Anderson College, Anderson, 174 student dormitory. $575,000.

▲ Ind., Beech Grove—CATHOLIC RETIREMENT HOME—Archbishop Paul Schulte, Indianapolis Catholic Diocese, 128 W. Georgia St. Indianapolis, first unit of Catholic Retirement Home. $1,000,000.

Ind., Fort Wayne—CLUBHOUSE—Fort Wayne Country Club, 5221 Covington Rd., clubhouse. $600,000.

Ind., Gary—SHOPPING CENTER—Gold Coast Shopping Center Inc. c/o Plumb Tuckett & Pickarsky, archts., 2649 Wabash St., 12 unit shopping center 22nd and Clark Rd. $600,000.

▲ Ind., Lafayette—SHOPPING CENTER—Wilbur C. Scheirer & Assoc., Frankfort, Ind., 30-50 store shopping center, 250,000 sq. ft. floor space, 20 acre site north of Brown St. levee, west of Wabash River between Lafayette and West Lafayette, Ind. $1,000,000.

▲ Ky., Fort Campbell—HOUSING—U. S. Eng., P.O. Box 1070, Nashville, Tenn., construct and finance 837 housing units (Capehart), incl. roads, walks, drainage, utilities. $15,000,000.

▲ Mich., Detroit—OFFICE, etc.—H. M. Seldon Co. (agent), 300 Penobscot Bldg., will not construct 11 story office, 4 story garage, shopping center, West McNichols and Meyers Rds., $15,000,000. Project abandoned. CD 10/2.

Mich., Detroit—CHURCH, etc.—Strathmore Methodist Parish, Dr. Luther Butt, pastor, c/o Earl L. Confer, archt., 14000 Strathmore St., church and educational bldg. $700,000.

Minn., Columbia Heights—CHURCH—Immaculate Conception Church, Columbia Heights, church. $550,000.

Mo., Fulton—DORMITORIES, etc.—Westminster College, R. L. D. Davidson, pres., Fulton, plans by Fred C. Sternberg, 4 S. Central Ave., Clayton, two 2 story, dormitories, 1 story cafeteria. $500,000.

Nev., Reno—SHOPPING CENTER—Chet & Link Piazzo, 613 W. 10th St., plans by Frank Green, P. O. Box 2104, 40,000 sq. ft. rein.-con. Plaza Shopping Center, 200 car parking facility. $500,000.

▲ N. J., Franklin—SHOPPING CENTER—Morris Greenberg, Sun Valley Way, Morris Plains, shopping center, Rte. 23 near Franklin Pond on 10 acre tract. $1,000,000-$1,500,000.

▲ N. J., Summit—HOSPITAL—Bd. Trustees Overlook Hospital, 193 Morris Ave., plans by James E. Ritchie & Assoc., 135 Clarendon St., Boston, Mass. two phases hospital addn.; one $3,500,000, and other $2,000,000. CD 12/18/47.

▲ N. J., Toms River—SHOPPING FAIR—Orsand Realty Co., 1 S. Main St., plans by Paul B. West, 911 N. Main St., shopping fair, 39 stores, professional bldg., storage warehouse and parking area, 2 story, masonry constr. $1,000,000.

▲ N. Y., Buffalo—RESEARCH CENTER—University of Buffalo, 3435 Main St., nuclear research center. $1,250,000. A. M. F. Atomic, Inc., (Div. American Machine & Foundry Co.), Broadway and Kenedy Rd., Cheetowaga, consult. engr. CD 12/9/55.

▲ N. Y., New York—APARTMENT—Lexington-38 Street Corp., 9 E. 40 St., Zone 17, plans by Irvin J. Berger, 9 E. 40 St., Zone 17, 15 story apartment, 302-10 Lexington Ave. $1,250,000. CD 12/21, under Maurice Epstein, as owner.

▲ Pa., Media—HOSPITAL—Riddle Memorial Hospital, 2040 Locust St., Phila., hospital. $3,000,000.

Pa., Pittsburgh—COMMUNITY CENTER—Irene Kaufman Settlement, 5738 Forbes St., plans by Edward Benswinger, 1247 Bellrock St., 2 story, bsmnt., brick, block, Henry Kaufmann Community Center. $625,000.

▲ Pa., West Mifflin—SHOPPING CENTER—West Mifflin Plaza, Inc., c/o Abbott Mortgage Co., Frick Bldg., Pittsburgh, 1 and 2 story, 300,000 sq. ft. brick, block shopping center, Lebanon Church Rd. $5,000,000.

Tex., Fort Worth—DWELLINGS—Frank C. Bliss & Co., 419 W. 7th St., plans by Horton & Wright, 3328 W. 7th St., 50 brick veneer residences, Eastwood Terrace addn. $750,000.

Tex., Houston—OFFICE—C. W. Bocock, III, 2002 Timber Lane, or c/o Highland Village State Bank, plans by Zimmerman & Bible, 500 Stuart St., 5 to 7 story office, off 2000 Blk. Westheimer St. $750,000.

Tex., Plainview—SANCTUARY—First Methodist Church, c/o Jack Payne, chn. Bldg. Comm., Plainview, plans by Wyatt C. Hedrick Co., 1200 T. & P. Bldg., Fort Worth, 1 story sanctuary and 2 story education bldg., masonry, stone trim, constr. $750,000.

Tex., Spring Branch—CHURCH—Spring Branch Christian Church, c/o Edward Bodet, archt., 3415 Montrose Blvd., Houston, church. $500,000.

▲ Tex., Waco—OFFICE, etc.—Lowich Properties, Inc., c/o Asher Lowich, Professional Bldg., plans by Wyatt C. Hedrick, archts.-engrs. Box 765, Fort Worth, 23 story 200,000 sq. ft. masonry, aluminum and glass panel exten. penthouse, office. $3,500,000; parking garage, $275,000. CD 10/17, under Owners, c/o Asher & Sander Lowich Real Estate Co., as owner.

▲ Ont., Toronto—HOSPITAL—Toronto Western Hospital, 391 Bathurst St., plans by Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., hospital expansion. $4,510,000. CD 12/8/47.

INDUSTRIAL BUILDINGS

▲ Calif., Fullerton—ENGINEERING and RESEARCH—Beckman Instruments, Inc., 2500 Fullerton Rd., plans by W. Davidson & Assoc., archts.-consult. engrs., 3142 Wilshire Blvd., Los Angeles, 108,000 sq. ft. engineering and research bldg. addn. $1,000,000.

▲ Calif., Salida—RESEARCH CENTER—Shell Development Co., Stoddard Rd., agricultural research center addns., incl. 6 new major laboratory and office bldgs., near here. $1,000,000.

Conn., Bloomfield—PLANT—Connecticut Printers, Inc., 85 Trumbull St., plans by Buck & Buck, 650 Main St., Hartford, 75,000 sq. ft. printing plant to house Case, Lockwood & Brainard Div. $750,000.

▲ Ill., Alton—PLANT—Federated Metals Div. American Smelting & Refining Co., 120 Broadway, New York 5, N. Y., 72,000,000 tons annual capacity secondary aluminum plant. Brown & Matthews, Inc., 404 4th Ave., New York, N. Y., consult. engr. (Correction—location of project). CD 12/3, under Ind., Alton.

▲ Ill., Des Plaines—RESEARCH CENTER—Celotex Corp., 120 S. LaSalle St., Chicago, plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, research center, Northwest Hy. $1,000,000.

▲ Mass., Andover—RESEARCH CENTER—Sylvania-Corning Nuclear Corp. (Sylvania Electric Products Co., Inc., 1740 Broadway, New York 19, N. Y. and Corning Glass Co., 1946 Crystal St., Corning, N. Y.), five building campus type nuclear research center, $20,000,000. (1st unit $5,000,000).

▲ Mass., Haverhill—INDUSTRIAL DEVELOPMENT—Haverhill Industrial Development Trust, James P. Cleary, atty., 174 Merrimack St., industrial development, incl. factory bldgs., 50 acres, Hillgate Ave. $1,000,000.

▲ Mich., Ann Arbor—MEDICAL RESEARCH CENTER—Parke Davis & Co., Joseph Campau St., Detroit plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., medical research center. $10,000,000. (Site selected). CD 1/23, under Mich., Detroit.

Mont., Whitefish—PLANT—Whitefish Plywood Corp., Whitefish, plant to produce plywood. $650,000.

▲ N. J., Pennington—LABORATORY—Socony Mobil Oil Co., Inc., 26 Broadway, New York, N. Y., research laboratory bldg. $1,000,000. A. E. Esser, c/o owner, ch. engr.

▲ N. J., Pennsauken—WAREHOUSE, etc.—Suckle Electronics Co. 22nd and Hayes St., Camden, warehouse, office bldg. and mfg. plant, $1,500,000. Stewart Barnett, 451 Market St., Camden, engr.

▲ O., Clarington—PLANT—Ohio Ferro-Alloys Corp., 839 30th St. N. W., Canton, plant for production of silicon alloys for aluminum, steel and chemical industries. $3,000,000.

▲ Pa., Bridgeport—PLANT—James Lees & Sons Co., Bridgeport, mfg. plant addns. $9,000,000.

S. C., Batesburg—PLANT—Lake Shore Industries, Inc., 3331 Superior St., Cleveland, O., 27,000 sq. ft. jet engines and commercial gas turbine engine mfg. plant. $500,000.

Tex., Balch Springs—FILM STUDIO PLANT—Alamo Pictures Corp., Balch Springs, via Mesquite, film studio production plant. $500,000.

▲ Tex., Cementville—PLANT—San Antonio Portland Cement Co., Cementville, remodel existing cement plant to provide elimination of dust. $1,000,000.

▲ Tex., Freeport—POWER PLANT—Dow Chemical Co., Freeport, power plant. $20,000,000. CD 5/1/52.

Tex., Houston—PLANT—Magnet Cove Barium Corp., 3133 Buffalo Speedway, plans by George F. & Abel B. Pierce, 2200 Welch St., 2 story, with fdn. for 6 addnl. stories plant expansion. $650,000.

▲ Wash., Everett—REFINERY—Standard Oil of Calif., 225 Bush St., San Francisco, Calif., 60,000 to 100,000 bbls. per day refinery. $65,000,000.

▲ Ont., Kitchener—PLANT—Bennett Ltd.; Kitchener Div., 534 Victoria Ave. N., (1st unit) 8,000 sq. ft. plant addn. to provide new office facilities and storage space. $1,000,000.

UNCLASSIFIED

▲ Calif., Los Angeles—BERTHING SLIPS, etc.—Los Angeles City Harbor Dpt., 1300 City Hall, five berthing slips in West Basin, San Pedro, $25,000,000; two passenger-cargo marine terminals, San Pedro, $8,000,000; bulk cargo loading, San Pedro, $5,000,000; two transit warehouses, $2,500,000 each at San Pedro; two ship terminals, in West Basin, 15x1,600 ft. conventional wharf, Los Angeles Harbor, San Pedro, $1,500,000. A. R. Martin, c/o owner, engr. CD 10/14/54.

▲ Calif., San Francisco—AQUARIUM—City and San Francisco Co.; c/o Director P. Wks., City Hall, restoration and modernize Steinhart Aquarium in Golden Gate Park. $1,000,000. CD 11/13/47.

▲ Calif., San Jose—RECREATIONAL FACILITIES—Bd. Supervs. Santa Clara Co., 1st and Rosa Sts., development of recreational facilities, Lexington and Anderson Reservoirs, near Santa Clara. $2,110,000.

Georgia—RURAL DISTRIBUTION LINES—Sumter Elec. Member Corp., Americus, 68 mi. electric distr. line and sys. improvs., Sumter Co. $710,000.

▲ Kansas—RURAL DISTRIBUTION LINES—Jewell-Mitchell Co-operative Electric Co., Mankato, 50 mi. rural distr. lines, 49 mi. 34.5 kv transmission line, sys. improvs., Jewell Co. $1,035,000.

Mo., St. Louis—PLAYGROUND—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, plans by Stuart M. Mertz, 7908 Bonhomme Ave., Clayton, Zone 5, and Layton, Layton & Rodes, Shell Bldg., 1221 Locust St., St. Louis, associated landscape archts., development of playground facilities in Euclid-Ashland Area. $800,000. CD 8/8.

▲ Oklahoma—GAS LINES—Cities Service Gas Co., 1st Natl. Bldg., Oklahoma City, 60 mi. 10 in. natural gas lines, Alfalfa and Grant Counties. $1,288,600.

▲ Texas—PIPE LINE, etc.—Gulf Oil Corp., Gulf Bldg., Houston, 530 mi. 10 in. products pipe line from Crane in Crane Co. to near Houston, $15,000,000; lay 116 mi. 10 in. products line from Lufkin to coast below Houston, $1,740,000; erect steel fractionating towers, Barbers Hill Field, $300,000; products pipe line pump station, Coahoma, $250,000; products pipe line pump station, Eastland, $350,000; products pipe line pump station, Dawson, $300,000; products pipe line pump station, Lufkin, $400,000; products pipe line underground storage, Anahuac, $250,000; constr. fractionating facilities, at Mont Belview, Houston, $1,000,000.

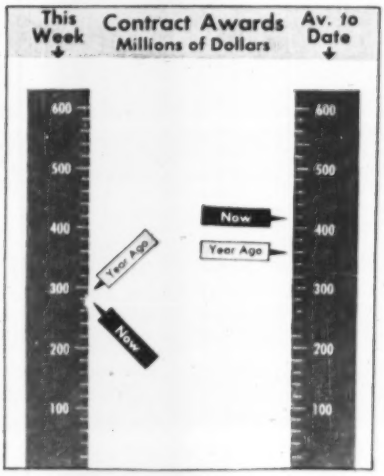
▲ Tex., Lubbock—STADIUM—Texas Technological College, M. L. Pennington, c/o Lubbock, plans by Wyatt C. Hedrick Co., 1200 T. & P. Bldg., Fort Worth, rein.-con. stadium. $1,000,000. CD 6/22.

Wyoming—RURAL DISTRIBUTION LINES—Riverton Valley Elec. Assoc., Riverton, 158 mi. electric distr. line and sys. improvs., Fremont Co. $535,000. CD 12/10/47.

(Proposal Advertisement see p. 76 to 78)

Construction Scoreboard

Activity this Week



* 3-day week

AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 52 wks 1956 millions	Chge %
Federal	$20.2	$1,688.7	+3
State and Municipal	113.2	6,532.9	+21
Total Public	133.4	8,221.6	+17
Total Private	148.9	13,490.4	+16
U. S. Total	$282.3	$21,712.0	+16
By Type of Work			
Waterworks	$4.0	$356.2	+13
Sewerage	7.3	578.6	+11
Bridges	3.9	621.6	+11
Highways	61.5	2,474.9	+16
Earthwork, Waterways	10.2	729.6	+34
Buildings:			
Public, Excl. Housg.	34.0	2,099.6	+21
Public Housing	2.0	318.1	+29
Private Housing	54.6	5,306.4	−14
Commercial	15.4	2,051.1	+24
Industrial	74.4	5,334.8	+81
Unclassified	15.0	1,841.1	−10
U. S. Total	$282.3	$21,712.0	+16

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

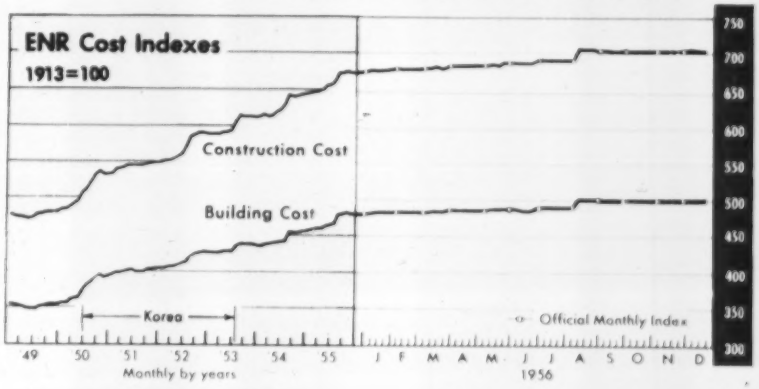
NEW CAPITAL FOR CONSTRUCTION

	Week of Dec. 20	Cum. 51 wks 1956 millions	Chge '55-'56 %
Corporate Securities	$115.8	$4,680.7	+30
State and Municipal:			
All Except Housing	241.2	4,628.1	−4
Housing	...	91.1	−11
Federal Loans	1.1	152.6	+20
Federal Aid	...	1,070.0	+25
Total Nonfederal	$358.0	$10,622.5	+12
Federal Appropriations:			
In U. S.	$...	$3,460.3	+2
Outside U. S.	$...	15.9	−81
Total New Capital	$358.0	$14,098.7	+9

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Dec. 20 1956	% Change from Nov. 29 1956	% Change from Dec. 22 1955
Construction Cost	705.39	+0.2	+4.7
Building Cost	499.75	−0.1	+4.3

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1940 = 100: Divide Construction Cost by 1.770; Building Cost by 3.548.



BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	Nov. 30 1956 (millions)	% Change from last Month	% Change from last Year
Total U. S. (ENR reported)	$103,905	+0.7	+13.6
By Ownership			
Private	43,626	−1.2	+15.0
State & Municipal	16,674	+2.9	+14.3
Federal	13,605	−0.3	+7.0
By Type of Work			
Waterworks	2,211	+2.4	+11.5
Sewerage	3,184	+2.1	+6.2
Bridges	2,942	+2.4	+8.3
Highways	12,442	+6.2	+9.4
Earthwork, Waterways	11,443	+0.2	+2.9
Public Buildings	18,898	+1.9	+17.0
Industrial Buildings	16,162	−2.4	+17.4
Commercial Buildings	18,431	−0.3	+18.5
Unclassified, Private	9,333*	−0.6	+5.3
Unclassified, Public	9,159	−0.3	+26.9
By Regions			
New England	5,993	+2.0	+19.2
Middle Atlantic	21,851	+0.8	+12.0
South	12,473	+0.1	+12.7
Middle West	18,775	+4.4	+15.5
West of the Mississippi	23,105	−3.0	+6.3
Far West	21,708	+1.8	+21.3

* Includes private bridges, $90 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	Nov.	1956 11-months (millions)	Nov.	% Change from '55 Year Cum.
Total U. S. (ENR reported)	$2,962	$23,891	+35	+11
By Ownership				
Private	1,057	11,979	−19	+19
State & Municipal	1,846	10,019	+140	−2
Federal	59	1,893	−50	+45
By Type of Work				
Waterworks	88	497	+9	−7
Sewerage	100	563	+189	+60
Bridges	96	438	+608	−34
Highways	859	2,349	+322	−39
Earthwork, Waterways	51	774	+45	−64
Public Buildings	621	4,656	+90	+74
Industrial Buildings	554	5,587	−19	+42
Commercial: Mass Housing	213	2,996	−20	+1
Other Building	222	2,453	−1	+24
Unclassified, Private	69**	943***	−50	−20
Unclassified, Public	90	2,635	−53	+106

** Includes private bridges, $467,000. *** Includes private bridges, $11.1 million.

Lease-Purchase Still Alive—But Barely

A batting average of .166 plus prospects of improvement, kept Lease-Purchase hopes alive as the General Services Administration read the results of bid openings on six projects last week.

One bid that looked good on all counts came in at GSA's Denver regional office for a federal office building at Albuquerque, N. M.

A specially created contractor-investor firm, the Albuquerque Building Co., of Dallas, offered to build the structure to GSA plans and specifications, getting its money back, with interest at 4%, in monthly installments, like rent, over a 25-year term.

Further, the new firm sets a price of $5,356,840, well within the limit of total project costs approved by the Budget Bureau and the Public Works Committees of the House and Senate. A margain of more than $850,000 below this established ceiling, set at $6,227,300, apparently allowed leeway for the architect-engineer fee, construction supervision and such site and overhead costs as may be charged against the project.

Aside from this single bid for the Albuquerque building, however, tenders were either non-existent or priced too high for the five other projects on the day's list.

A Kansas City, Mo. post office and court house building drew one bid that scraped the project ceiling. The Long Construction Co. of Kansas City put in a price of $2,383,000 for this job, as compared with an overall cost limit of $2,393,303. Long's bid would have to be scaled down considerably to leave enough margin for other project costs.

• **Late mails hold hope**—One other project, a post office building at Burlington, Iowa, still had a possible chance of bringing in an acceptable bid as opening day drew to a close.

No bids for this job arrived in time for the opening, but the postmasters in Minneapolis and St. Paul, certified that two bids have been mailed in time for delivery ahead of the deadline—in any season except just before Christmas. Cost ceiling for the Burlington project is $1,328,987.

A smaller project with a cost limit of $543,210—for a post office and court house building at Abingdon, Va., brought out two tenders. Only one of the two was a responsive bid, meeting GSA's new single-package requirement to construct and finance the building at 4%. The price in this proposal—$595,500—topped the project ceiling. The Trammell Construction Co. of Bristol, Tenn., made this offer.

The second bid for the Abingdon job is not considered responsive because it offers to do the construction only—under the old separate bid procedure that was permissible before GSA in early November limited all tenders to combination bids, including both financing and construction in a single package.

Fred S. Vance Construction Co., also of Bristol, Tenn., made the construction bid at a price of $517,171. Actually this firm had prepared and would have presented a combination bid for the project, if its surety companies had not run into doubts about GSA's new contract terms.

• **Sureties in doubt**—A number of bonding companies decided to write no performance bonds for Lease-Purchase contracts until their lawyers had a clearer understanding of the risk involved.

As these people see the situation now, the surety companies are in effect asked to write not merely a performance bond but a completion bond for a construction bidder who is dependent on two financing houses, one for the temporary construction financing and the other for the long-term money.

If either financial source goes sour, the bonding company, these surety people fear, would be responsible for completion of the project.

Until these fears are cleared away, some of the biggest bonding companies are staying away from lease-purchase bidders. They see a big building program in the making, and they want to get their share of the business, but they won't take the bonding risks until GSA spells out the scope of the surety companies responsibility.

Whether surety bonds were a factor or not, two of GSA's six projects last week got no bids at all. Those two were a federal office building in Huntington, W. Va., with a cost limit of $3,298,280, and a post office structure in Green Bay, Wis., with a ceiling of $1,615,000.

Another Chance

Army Engineers will open bids Jan. 29 for initial construction of the No. 2 power plant at Fort Peck Dam in Montana. It will be the second bid opening for this project.

Bids originally were opened in October, but were thrown out when the apparent low bidder, Fegles Construction Co. of Minneapolis, claimed a $200,000 arithmetical error had been made in its bid.

The contract provides for control shaft modification and powerhouse foundation work.

Estimated cost of the work is $26.3 million.

Second Try

Blocked once by costs, city seeks federal aid for big housing project

Rebuffed once by the federal government, Detroit Housing Commission officials have renewed their plea for approval of a $20-million housing project to provide homes for the aged and large families with low incomes.

Revamped plans will be presented in the new appeal.

Present plans call for construction of two-story building and high-rise apartment buildings. The two-story buildings would contain a total of 550 units of three and four bedrooms; the high-rise apartment buildings would provide a total of 700 one-bedroom units.

According to Detroit sources, government officials rejected the plans initially because cost per unit exceeded $17,000.

City housing officials now feel they can bring the cost per unit now to slightly less than $17,000.

Mark K. Herley, assistant housing director, told ENR: "By adding more units, we have been able to drop the cost per unit to slightly under $17,000 and we are going to fight to get this development approved."

Working Capital Needed, M-K Omits Extra Dividend

Morrison-Knudsen, one of the nation's largest contractors, will not pay an extra dividend at the end of the year. This is the first time in nine years that M-K has not declared it.

Reason for the cancellation, according to H. W. Morrison, president of M-K, is the need for an "extraordinarily large amount of cash working funds." The quarterly dividend of 40 cents per share will be continued.

Morrison cited the large volume of

work which Morrison-Knudsen has under way, as well as projects to be started in 1957. He told the board of directors that the list of uncompleted domestic and foreign construction contracts totals about $400 million.

Net income of the company and its subsidiaries for 1956 will exceed $5 million, after taxes, Morrison said.

Steel Prices Up

Scattered hikes reflect the rising cost of scrap, wage and freight increases

Steel prices are going up again.

Major producers put scattered price hikes into effect last week. General increases may come in January or February because of rising scrap prices, higher freight charges and a cost-of-living wage increase for 650,000 steelworkers. Plates, stainless steels and sheet steel have been affected by the most recent price increases.

U. S. Steel boosted the price of stainless steel from 3% to 4%. Both Youngstown Sheet & Tube and Pittsburgh Steel posted higher price tags on hot and cold-rolled sheets, slightly less than 3%. These followed similar price increases announced earlier this month by other producers.

Behind the price increases were these factors:

- Higher freight rates, up 7% in the East and 5% higher in the West because of emergency increases granted to the railroads by Interstate Commerce Commisison.
- Rising scrap costs, now at $67 a ton, as against $47.50 per ton in June.
- Higher wage rates, effective Jan. 1, for 650,000 steelworkers who will get a cost-of-living increase of three cents an hour because of a rise, since mid-June, in the Consumers Price Index, compiled by the Bureau of Labor Statistics.
- A feeling among producers that the government will not approve more liberal tax amortization privileges for steel expansion, thus necessitating high earnings to pay for the enormous steel construction programs.

It is too early to tell how much construction costs will rise because of the higher steel prices. To some extent, the price of structural steel is compounded whenever the steelworkers get a wage increase because employees of the fabricators get a similar increase which is reflected in the price the contractors pay for steel at the site.

Construction Markets

An On-the-Spot Report From Miami

"I'm afraid it's just the start of another spiral of increasing interest costs and that we will soon be back in the same position."

That is the somewhat gloomy reaction of John F. Beatty, president of the Home Builders Association of South Florida, to the recent hike in the interest rate for mortgages insured by the Federal Housing Administration.

But, despite a tide of complaints about tight money and increasing land costs, 1956 has been a good year for Miami homebuilders. Housing starts are running ahead of 1955; mortgage deeds for the first 10 months topped the year-ago period by $10 million. And, 1957 should be even better for homebuilders, judging from housing projects that are now in various stages of planning.

Land costs have risen spectacularly. When they climbed from $1,000 an acre to $5,000, some postwar local builders gave up. But, developers from the North entered the south Florida housing market and stayed in even when the price of land went to $8,000 an acre. They proved they could make money even with high land costs—and veteran Florida builders who left the market now are coming back.

The tourist is still the mainstay of Miami's economy. To house, feed and entertain the sightseers from colder climes, the city will spend millions for construction in 1957.

A Miami Beach landmark, the MacFadden Deauville is being razed. In its stead, New York City developer Jacob C. Cohen will build a $15-million, 550-room hotel, slated for completion in December 1957.

Another New Yorker, Alfred Kaskell, is clearing a site for a 600-room, $20-million hotel expected to be open for the 1957-58 season. Architects are designing the project so that 200 rooms can be added in the future.

On the Miami side of Biscayne Bay, 1957 will see the start of a $5-million, 18-story First National Bank building. The federal government is scouting for an architect to design an $8-million federal office building.

Steel is rising on the $10-million DuPont Plaza Center, which will combine a 14-story, 301-room hotel, office building and architects' bureau.

Early this month, Eastern Air Lines announced plans for a $5-million jet engine overhaul plant to be built in 1957 at Miami International Airport.

Biggest single contract in sight for 1957 is the $25-million Capehart housing project on the recently-reactivated Homestead Air Force Base, 30 miles south of Miami. Bids probably will be asked before March.

Still a hot topic in construction circles is the year-old story that Howard Hughes has picked south Florida for the site of an aircraft manufacturing plant—a big one.

Earlier this month, a prominent contractor and close associate of Hughes, Del Webb, confirmed reports that he has been negotiating for nearly 3,000 acres for home sites in the northern section of Dade County.

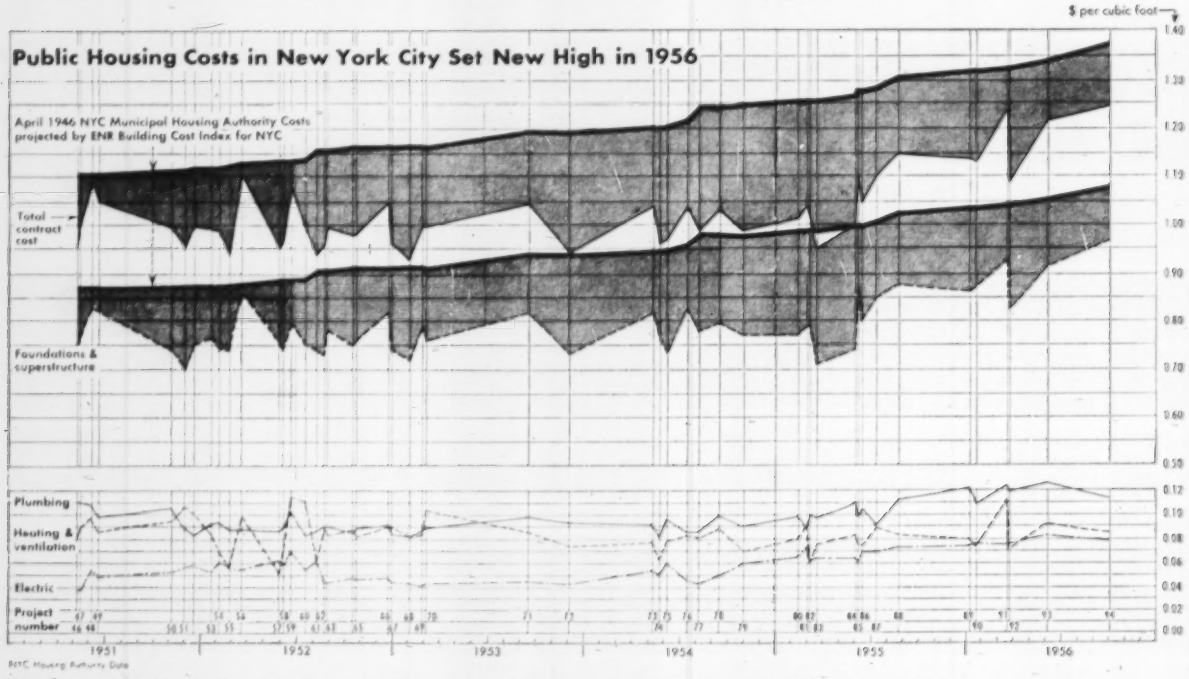
With rapid growth, traffic has been and still remains the number one problem in greater Miami.

Part of the answer to the traffic problem may lie in the master plan prepared by planning expert Wilbur Smith, of New Haven, Conn. An $80,000 Smith survey, financed jointly by the city, county and state, and released last month, calls for the spending of $193 million to meet Greater Miami's traffic needs for the next 20 years.

Key features of the traffic plan are an elevated expressway around the perimeter of downtown Miami and a series of expressways cutting new paths through the city.

City officials, slightly stunned by the magnitude of the plan, are giving it a close look.

While the Smith plan could create a vast construction market for the future, contractors have a more immediate interest in public works that won voters' approval in November. At a referendum, voters agreed to spend $7.5 million for hospital expansion and also approved bond issues that will make another $20 million available for school construction.



New York City Pays More for Public Housing

Stiff competition among contractors and economies stemming from standard design have helped the New York Housing Authority to hold cost increases to less than that experienced throughout the housing industry as a whole, as measured by the ENR Building Cost Index.

However, these factors still did not prevent contract bid prices on public housing projects in New York during 1956 from rising to new high ground. Only exceptions to a general increase were in the heating and ventilating facilities for the projects.

Analysis of six projects started during 1956 would seem to lend support also to the fact that the bigger the project the lower the cubic foot bid price.

The largest such development, the Douglass Project, showed up with the lowest per cubic-foot price of all six projects started this year.

On a cost per room basis, the $1.088 per cu ft involved in the Douglass project was 12% less than the $1.242 all-time high rolled up by the latest project, Millbrook Houses II, in October of this year.

Officials of the authority explain this drop on the basis of "cut-throat" bidding. The range of bidding was very narrow.

The tough competition was reflected throughout the bidding items. Foundation and superstructure costs of $0.823 per cu ft for Douglass were as much as 15% under the $0.965 for Millbrook II.

For heating and ventilating facilities, bid prices have fluctuated in a narrow range for the past three years, with the single exception of Summer Houses II, which in March of this year almost topped the high of mid-1952. Again, Douglass bids scored a low of $0.071, 36% below the Summer II bid.

The year's low in electrical construction bid prices appeared in January when Millbrook Houses I recorded $0.075 per cu ft. Here Douglass slipped a little coming out with $0.077. High cost honors went to the Wagner Houses II project, turning up in June with a $0.083 unit price. This was 11% above Millbrook I, and also a new high.

Housing Contract Totals and Unit Prices

Awards by New York City Housing Authority

		1st Quarter 1956			2nd Quarter 1956	4th Quarter 1956	
Project Number		(89)	(90)	(91)	(92)	(93)	(94)
Project		Millbrook Houses I*a*	St. Mary's Park Houses *b*	Sumner Houses II*a*	Douglass Houses *a*	Wagner Houses II*c*	Millbrook Houses II*a*
Total constructed rooms	No.	2,780	4,030	2,100	8,079	4,173	2,303
Total apartments	No.	690	1,007	514	1,999	985	565
Rooms per apartment	Av. No.	4.03	4.00	4.09	4.04	4.24	4.08
Total cubage	Cu. ft.	5,708,391	8,922,993	3,999,113	16,984,651	7,606,440	4,739,196
Bid date		1 11 56	1 24 56	3 20 56	3 23 56	6 5 56	10 2 56
Cost per:							
Total contract		$6,501,642	$10,099,528	$4,944,818	$18,484,620	$9,239,193	$5,883,183
Constructed room		2,338 72	2,506 09	2,354 68	2,287 98	2,214 04	2,554 37
Apartment		9,422 67	10,029 32	9,620 27	9,246 93	9,379 89	10,412 71
Cubic foot		1 139	1 132	1 237	1 088	1 215	1 242
Foundations & superstructure		4,925,519	7,791,338	3,098,904	13,969,573	6,944,712	4,576,613
Constructed room		1,771 77	1,933 33	1,761 38	1,729 12	1,664 20	1,984 63
Apartment		7,138 43	7,737 18	7,196 31	6,988 28	7,050 47	8,089 58
Cubic foot		0 863	0 873	0 925	0 823	0 913	0 965
Heating and ventilation		451,855*e*	657,600*d*	444,137*e*	1,207,677	702,505*e*	404,235*e*
Constructed room		162 55	163 18	211 49	149 48	168 35	175 53
Apartment		654 91	653 03	864 08	604 14	713 22	715 46
Cubic foot		0 079	0 074	0 111	0 071	0 092	0 085
Electrical construction		426,159	679,400	304,466	1,309,470	633,410	371,241
Constructed room		153 29	168 59	144 98	162 08	151 79	161 20
Apartment		617 62	674 68	592 35	655 06	643 06	657 06
Cubic foot		0 075	0 076	0 076	0 077	0 083	0 078
Plumbing		698,079	971,182	497,311	1,997,900	958,546	537,094
Constructed room		251 11	240 99	236 83	247 30	229 70	233 21
Apartment		1,011 71	964 43	967 53	999 45	973 14	950 61
Cubic foot		0 122	0 108	0 124	0 118	0 126	0 113
Piling, abnormal foundations		230,000	1,337,000	50,000	400,000	100,000	352,000

a state-aided project *b* part 4 city-aided program; without cash subsidy *c* federally aided project *d* includes total cost of boiler *e* includes proportionate part of cost of boiler

Plumbing bids have been climbing steadily for the past three years, reaching a peak in June when Wagner Houses II reported $0.126 per cu ft. Douglass wound up in the middle of the price range for the six projects with $0.118 bid.

If the Housing Authority's general per cu ft bid price had conformed to the ENR Building Cost Index for New York City, total cost for the highest project, Millbrook II, would have been $1,373 instead of $1,242. This would have been an increase of 11%.

Business Briefs . . .

• **More interest**—After a $27 million highway bond issue was ignored in the municipal bond market because of a 3.5% maximum interest rate, the Michigan State Administrative Board decided to boost the interest rate to 4%, offer the bonds again in January.

• **Mississippi's tallest**—A 15-story, $5,-million office building, to be the state's tallest, will be built in Jackson, Miss., by industrialist R. E. Dumas Milner.

• **Capehart housing**—The Federal National Mortgage Assn. upped the price it will pay for mortgages insured by the Federal Housing Administration on Sec. 803 military housing, in a move to spur along the Capehart housing program.

• **Fabricator's best year**—International Steel Co., eighth largest structural steel fabricator in the nation, had its best year in 1956 since the founding of the firm in 1902.

• **No improvement**—A second effort by the city of Albuquerque, N.M., to sell $1 million in revenue bonds to finance off-street parking facilities failed to produce any bids. Earlier this year, the city rejected a bid for the bonds because of the interest cost (4.399%). This time there were no offers. But, the state may buy part of the issue. If so, the city will try to negotiate a private sale for the balance of the bonds.

• **Bigger budget**—Southern California Edison's capital expenditures budget for 1957 has been raised by $13 million from previous estimates. It now totals a record $135 million. Of the increase, $10 million will go for initial construction work on the long-anticipated mammoth pool hydro project in the high Sierras. Federal Power Commission approval is expected soon for new plant and equipment. Of this amount, $32 million is earmarked for a 200-mile gas pipeline project.

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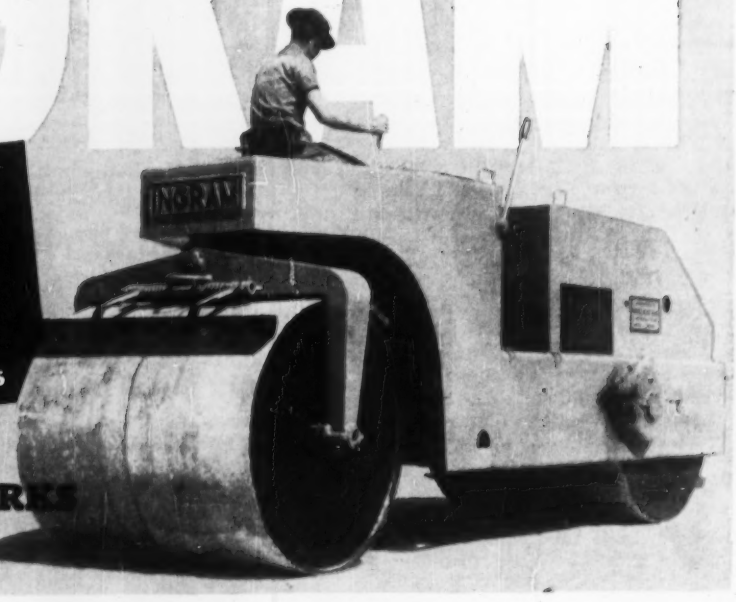

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Labor Peace Tied to Freedom

Free collective bargaining with a minimum of government interference is called the key to sound labor relations

Last year, when Congress had before it a Senate bill to require general contractors to name their proposed mechanical specialty contractors in bids on federal construction, the Associated General Contractors of America opposed the bill and urged that the industry solve its own problems. "What we all want," said the AGC, "is less government control of our business."

The same philosophy now is applied by the boilermakers union to labor relations in general. In the current issue of its monthly journal, the union asserts that laws "are not the answer" to industrial peace and suggests the solution lies, instead, in efforts on the part of management, labor and the public to preserve and improve the system of free collective bargaining. The suggestion comes at a time when the forthcoming sessions of Congress and state legislatures already are generating a host of proposed changes in the nation's labor laws, ranging from Taft-Hartley Act amendments to the outlawing by states of organizational picketing.

"Labor and management," warn the boilermakers, "have a mutual interest in developing a system of collective bargaining which requires a minimum of government intervention. Their success or failure may determine the preservation of our free enterprise system."

The union takes the position that sound industrial relations can be achieved only by the "active collaboration of management and workers." It maintains that labor peace cannot be forced or "appropriate attitudes" legislated because "good will" and good relationships—which are essential to peace—must stem from the joint efforts of those directly involved.

Specifically cited as legal instruments that "have never settled any dispute" are the Taft-Hartley Act and right-to-work laws, which are now under active study on many fronts. Last week, for example, the Administration was reportedly considering asking Congress to amend the emergency-strike provisions of the Taft-Hartley Act to give the President wider latitude in the use of the 80-day injunction; a labor subcommittee of the House was toying with the idea of seeking changes that would give employees a stronger voice in deciding whether to accept wage increases in the form of fringe benefits rather than higher wage rates; Labor Secretary Mitchell's Advisory Committee for the Construction Industry still was trying to find a common meeting ground on proposed changes affecting contractors and the building trades. And all this study is looking in the direction of the President's special message to Congress and the Administration's pledge to "overhaul and improve" the law.

"We are sure," the boilmakers say, "that labor and management can agree that industrial strife, regardless of the merits of the controversy, is economically wasteful. Likewise, we can agree that the greatest source of waste in industry is the lack of cooperation between employers and employees and it follows that the best interests of the public are served by the peaceful settlement of labor disputes." And the union contends that this can best be accomplished by direct negotiation under the principle of free collective bargaining without third-party interference or additional legal barriers.

Arbitrator Turns Down Industrial Union Claim

The right of industrial unions to curb the practice of using outside contractors to do in-plant repair and construction work that members of the plant union could do themselves has been further defined—this time in St. Louis.

The independent union of chemical plant workers had challenged the right of Mallinckrodt Chemical Works to contract out plant repair and construction work, claiming the company was bound to give the work to union members within the plant. The dispute went to arbitration and the union lost because the company had not committed itself by contract to refrain from construction by contract.

The arbitrator took the position that one of the rights of management is the right to decide whether to do the work itself or to let it out under contract. Restrictions on that right can be put in the labor contract between a plant and its union, the arbitrator said, but, until the right is restricted, the union has no basis for protesting the employer's choice of action.

Two arguments advanced by the union were these: The company had agreed to let the union know in advance if it planned to contract out such work; in the past, the company had asked the union's prior consent to letting out work. It was conceded that the company's right was not contractually limited, and the arbitrator ruled that neither agreement to give notice nor past practice added up to a legal restriction on the right to use outside contractors.

Bureau of Apprenticeship Reorganized by Mitchell

The U.S. Department of Labor has combined its Bureau of Apprenticeship with other Labor Department training services and has named W. C. Christensen as Director of the new Bureau of Training and Apprenticeship.

In announcing the organizational change, Secretary of Labor James P. Mitchell said the move is designed to strengthen the department's program to improve the skills of the nation's work force through apprenticeship and other training.

As part of the reorganization, William F. Patterson, former director of the Bureau of Apprenticeship, was earlier promoted to the new post of Special Assistant to the Secretary of Labor. Edward E. Goshen, former deputy director of the Bureau of Apprenticeship for Industrial Promotion, will head apprenticeship service of the new bureau.

Christensen started his career as a pattern maker apprentice and architectural draftsman. He has been deputy director of operations for the Bureau of Apprenticeship since 1954.

International Labor Body Analyzes Work Stoppages

On a global basis, the number of work stoppages in the construction industry during the last seven years has compared favorably with those in other segments of the economy.

The International Labor Organization has completed an analysis of labor disputes in 28 countries over the last seven years and estimates that more than 500 million man-days were lost through work stoppages during that period. Over 75 million workers were involved. Estimated loss for 1955 is 60 million man-days—a decline of 36 million since 1949.

In seven selected countries—Australia, Canada, France, Japan, Italy, United Kingdom and United States—there was no great difference in the number of days lost in manufacturing, construction, transport and communications. Greatest loss was in mining.

Amendments Are Urged for Hobbs Act

Teamsters plan to ask Congress for amendments that will exclude ordinary union activities from racketeering law

The ticklish question of whether the federal Hobbs Anti-Racketering Act embraces the ordinary economic activities of labor unions—such as efforts to organize, to obtain employment or to improve working conditions—will again be laid before Congress when it convenes next year. Although frequently resorted to in construction "shakedown" cases, the law has not yet been hurled—as some believe it could be—at participants in a strike for higher wages.

Efforts to have the law amended will be spearheaded by the teamsters union, which calls the law "the most anti-labor statute on the books today." The union's quarrel is not with legislative efforts to curb labor racketeering but with what it considers a perversion of the law into an instrument for "crushing and crippling the legitimate activities of working men and women."

Originally enacted in 1934 and amended in 1946, the law makes it a criminal offense to interfere with interstate commerce by "robbery" or "extortion." Maximum penalties of a $10,000 fine and 20 years in prison are imposed. The law is not concerned with the complicity of those who yield to the "shakedowns," whether the cost is passed on to the ultimate consumer or not.

Claimed by some to have been directed initially at the Dillinger type of racketeering, the most unequivocal application of the law has occured in the typical quid pro quo case of simple extortion, where the defendant is personally enriched. An example is this month's conviction in Louisville, Ky., of the business manager of the electrical workers' Local 369. During the trial, several contractors testified that the defendant, under the threat of a refusal to furnish workers, had demanded substantial sums of money, which were paid in most cases to the defendant's wife. Without success, the charges were denied and the claim advanced that the monetary transfers were gifts expressing appreciation for services rendered.

The teamsters—more troubled by the law than most trades because of their activity in interstate commerce—claim, however, that the courts no longer require a showing of personal gain for conviction. The result, they say, is that a union official runs the risk of conviction every time he participates in collective union action to obtain new members, employment, higher wages or better working conditions. Support for such an argument comes not only from court decisions, the union indicates, but also from the 1946 amendment that wiped away the protection formerly afforded "the payment of wages by a bona fide employer to a bona fide employee."

Outlined in the December issue of "The International Teamster" are the amendments that the teamsters will seek. These include a redefinition of "extortion" to require a showing of "personal use or enrichment," and specific exemption of union efforts to obtain employment, new members, higher wages or better working conditions. The teamsters state that the proposed amendments are "aimed not at the protection of the labor racketeer who preys on employers and employees for his own personal gain but are pointed rather at the very heart of the problem—protection for the ordinary and traditional activities of working men and women."

Operating Engineers Ask For Portal-to-Portal Pay

Operating engineers doing tunnel work in California have informed the Northern and Central California Chapters of the Associated General Contractors of America that they expect to receive portal-to-portal pay. The statement came from and applies to members of Local Union No. 3.

In a letter to the two AGC chapters, the union said that its members would report for work at the tunnel entrance or adit—whichever the employer designates—and that working time, for both straight-time and overtime purposes, would run from the time of reporting to the time of return to the entrance or adit.

The union stated that underground transportation is a matter within the control of the employer and that engineers should be paid for all time spent underground, including time spent waiting for transportation as well as time consumed in transit.

Health Officials Condemn Facilities Given Workers

Health officials in Phoenix are preparing an ordinance to halt use of contaminated drinking water and inadequate sanitary facilities on construction jobs in the city.

The action stems from a health survey, which disclosed the following conditions:

- Out of 31 drinking water samples taken from containers on various building jobs, three were contaminated and unsafe.
- Out of 244 construction projects, sanitary facilities were provided on only 78. On those where facilities were provided, room for improvement was found.

Plasterers Drop Demand For Three Trowel Coats

In a San Francisco East Bay Area dispute over the number of coats of stucco required for the exterior of homes, the plasterers union has withdrawn its demand for three trowel coats.

The action occurred at a hearing to render permanent a temporary restraining order obtained by the Associated Home Builders of Greater East Bay against the Plastering Contractors Association and Local 112 of the plasterers union. A further hearing now must be held on the builders' contention that they be allowed to substitute an oil or acetate base paint for a third coat of plaster.

Builders have been using two coats of plaster plus a brushed-on coat of paint or sealer. The brush-on work had been done by painters under an agreement between the plasterers and painters unions. Following their demands for a third trowel coat applied by them, plasterers began to pull men off of two-coat jobs. Plastering contractors in Alameda and Contra Costa Counties acceded to the union's demand. Builders complained the results were less effective and more costly.

Although most of the building codes in question require a third coat of plaster applied by trowel or brush, the builders contend the law permits approval of a material or method equivalent to the minimum standard and that the paint coat is an acceptable substitute.

Apprenticeship Conference Is Planned for Six States

Six of the North Central states have formed the North Central States Apprenticeship Conference, which is scheduled to hold its first meeting next Nov. 20-21.

Similar in scope to the Eastern Seaboard and Southern Apprenticeship Conferences, the purpose of the new conference is to discuss the problems of training apprentices and to stimulate

interest in and to improve training programs within the area. Planning of the conference was undertaken last month, under guidance of H. Mayne Stanton of the Chicago Building Construction Employers' Association, during the Ohio State Apprenticeship Conference.

Participating states are Illinois, Indiana, Kentucky, Ohio, Michigan and Wisconsin.

Although the descriptive titles of regional conferences carry the term "apprenticeship," conference agendas have, in the past, also embraced the subject of journeymen training.

Prevailing Wage Provision In City Contracts Upheld

A municipal court in Philadelphia last week upheld a clause in all city construction contracts requiring contractors to pay union wage scales and to comply with union working conditions.

Alert Electric Co., a nonunion electrical contractor, had challenged the validity of the requirement, which it charged was the result of a conspiracy between city officials and labor unions.

In sustaining the contract clause, Judge E. Levinthal justified its use as an assurance against delays by strikes and walkouts in protest against substandard wages and working conditions. He also indicated that the clause is in harmony with the city charter mandate that contracts be awarded to the lowest "responsible bidder"—a qualification covering employment practices and the caliber of workers as well as other factors. "If workmen are receiving less than prevailing wage scales," Levinthal said, "it may be reasonable to infer that they may not be as experienced, as competent and as skilled as those employees who can command the prevailing standard of compensation."

Counsel for Alert announced that the decision would be appealed.

Labor Briefs . . .

• **NLRB expands**—A new regional office of the National Labor Relations Board will be opened in Tampa, Fla., on Jan. 2 with Harold A. Boire as director. To be known as Region 12, the office will cover all of Florida except the 12 northwestern counties.

• **Mortgage money**—Welfare funds to the tune of $150,000 from three northern New Jersey unions—carpenters, laborers, masons—will be available after Jan. 1 for the purchase of VA and FHA mortgages. The fund, which homebuilders hope will be swelled to $1.5 million by participation of seven other unions, will be administered by a local bank.

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: January 22, 1957

Contract NYA-150.001

ADVERTISEMENT

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
ADDITIONAL WATER SERVICE
SUPPLY AND
DEMOLITION OF STACK AND WATER TOWER

Sealed proposals for the installation of an additional water service supply to the building located at 145-68 228th Street, Springfield Gardens, Long Island, and the demolition of the stack and tower on said building will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 22, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 27, 1956

Bids: February 4, 1957

Construction of Sanitary Sewer

MUNICIPALITY OF METROPOLITAN TORONTO
COXWELL AVENUE SANITARY TRUNK SEWER
Contract D-17-56
Contract D-18-56

SEALED TENDERS are invited for the construction in tunnel of the Coxwell Avenue Sanitary Trunk Sewer, 8'6" internal diameter, as described herein:

(a) Contract D-17-56—on Rhodes Avenue from approximately 447 feet south of the south limit of Gerrard Street northerly to the south-west corner of Coxwell Stadium, thence north-easterly across Stadium property to Coxwell Avenue at Hanson Street, thence northerly on Coxwell Avenue from Hanson Street to the centre line of Danforth Avenue, a distance of 4,612 feet more or less.

(b) Contract D-18-56—on Coxwell Avenue from the centre line of Danforth Avenue northerly to O'Connor Drive, thence northerly on easement to a terminus in the Don Valley on the northern limit of the right-of-way of the Hydro-Electric Power Commission of Ontario, a distance of 6,727 feet more or less.

Tenders may be made for one contract, for both contracts separately, or for both contracts as one tender.

Tenders must be addressed to the Chairman and Members of the Executive Committee, The Municipality of Metropolitan Toronto, and must be delivered to the Metropolitan Clerk at his office, 67 Adelaide Street East, Toronto 1, not later than twelve o'clock noon (Eastern Standard Time), on Monday, February 4, 1957.

Envelopes containing tenders must be plainly marked on the outside as to contents. Specifications, Form of Tender and Plans may be obtained at the Metropolitan Department of Works, Project Division, 171 Eglinton Avenue East, Toronto 12, on payment of a deposit of One Hundred Dollars ($100.00). Such deposit will be refunded upon the return, in good condition, of said Plans and Specifications to Mr. R. L. Clark, Commissioner of Works, within 60 days of date of closing of tender.

Conditions relating to tendering, as prescribed by Specifications, Form of Tender, etc., must be strictly complied with. The lowest or any tender will not necessarily be accepted.

Frederick G. Gardiner, Q.C.,
Chairman, Metropolitan Council.
W. W. Gardhouse,
Metropolitan Clerk.

December 10, 1956.

Bids: January 4, 1957

Washington Suburban Sanitary Commission

CONTRACT NO. 1912
FURNISHING AND DELIVERING
SANITARY GARBAGE AND REFUSE
COLLECTION UNITS

Sealed proposals for furnishing and delivering six (6) sixteen cu. yd. minimum capacity packer type refuse collection units mounted on truck chassis (four (4) units to be traded in) will be received in the office of the Purchasing Agent, Room G-13 of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland until 10:30 A. M. Eastern Standard Time, Friday, January 4th, 1957 at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsberry, Purchasing Agent of the Commission, Hyattsville, Maryland.

T. Earle Bourne, Chairman
Frank L. Hewitt, Jr. V-Chairman
J. Norman Ager
James R. Bland
Willard A. Morris
L. S. Ray
Commissioners

Attest:
John T. Bonifant
Secretary

Bids: January 24, 1957

Dearborn-Melvindale Disposal Authority Dearborn, Michigan

NOTICE TO CONTRACTORS

Sealed bids for Construction of Building for the Dearborn-Melvindale Refuse Incinerator will be received at the office of the Chairman of the Authority, Second Floor, Department of Law, Dearborn City Hall, Dearborn, Mich., until 2 p.m. Eastern Standard Time, on January 24, 1957.

Work includes construction of a proposed building to house incineration and appurtenant equipment. Other contracts have already been awarded for furnishing four 175-ton incinerator units, certain appurtenant equipment, and the chimneys.

Contract drawings and documents may be examined and obtained at above office, and office of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston, Mass., weekdays except Saturdays and holidays; $100 deposit.

Bid security: $25,000 cashier's or certified check; or Bid Bond for 5% of bid. 100% Performance and Lien Bonds required.

BOARD OF TRUSTEES
DEARBORN-MELVINDALE
DISPOSAL AUTHORITY
By
Dale H. Fillmore, Chairman

OFFICIAL PROPOSALS

Bids: January 10, 1957

Delaware River Port Authority of the Commonwealth of Pennsylvania and the State of New Jersey

Administration Building
Camden, New Jersey
WALT WHITMAN BRIDGE
CONTRACT NO. 11

Sealed bids will be received for "Highway Signs" on the Philadelphia, Pa. and New Jersey Approaches and the bridge structures of the Walt Whitman Bridge over the Delaware River connecting Packer Avenue, Philadelphia, Pa. and Gloucester, New Jersey, known as Contract No. 11, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:30 P. M., Eastern Standard Time, Thursday, January 10, 1957, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $15,000.00, payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialman's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the various sites of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
EXECUTIVE DIRECTOR

December 4, 1956

Bids: February 5, 1957

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed Proposals will be received at the office of the Director, Purchases and General Services, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A. M. E.S.T., February 5, 1957, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division IV—Administration Building and Sludge Structures", and comprises the furnishing of all labor, materials, equipment and work incidental thereto, for the construction of the Administration Building, the Sludge Control Building, the Sludge Tanks, and interconnection tunnel, as shown, specified and directed.

Location: The Administration Building and Sludge Structures will be located at the site of the Sewage Treatment Plant, adjacent to the southwest bank of the James River at Rockett's Wharf, northeast of the United States Naval Diesel School, in the City of Richmond, Virginia.

The proposal and other contract documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the contract documents may be obtained from the office of the Director of Public Works upon the deposit of Twenty-Five Dollars for each set. Any general contractor who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded fifteen dollars per set for each additional set. All others will be refunded fifteen dollars per set upon the return of the documents in good condition within ten days after the opening of the bids.

J. W. Huffman
Director of Purchases and
General Services

OFFICIAL PROPOSALS

GOVERNMENT OF IRAQ, DEVELOPMENT BOARD AND MINISTRY OF DEVELOPMENT BAGHDAD, ELECTRIFICATION OF NORTHERN AND CENTRAL IRAQ SUBSTATIONS, CONTRACT No. 9, SWITCHGEAR AND ASSOCIATED EQUIPMENT. The Development Board and Ministry of Development of the government of Iraq invite tenders from qualified firms for the supply and delivery, erection and supervision of operation of 132 kV, 66 kV, 11kV and switchgear and associated equipment for the substations of Dibis, Erbil, Mosul, Hammam al Alil, Kirkuk, Sulaimaniyah and Sarchinar in Northern Iraq and Baghdad in Central Iraq. The supply and erection of power transformers and Civil Engineering work are excluded. Tender Documents may be inspected on and after December 17, 1956, until January 28, 1957, at the following addresses: (1) Directorate General of Legal Affairs and Contracts, Ministry of Development, Development Board, Baghdad. (2) Embassies of Iraq in Washington, London, Paris and Bonn. (3) Royal Legations of Iraq in Brussels and Rome. (4) Honorary Consulate of Iraq in Stockholm, and Egyptian Legations in Bern and The Hague. (5) At the Office of the Consulting Engineers, Messrs. Electrobel Traction et Electricite, 1, Place du Trone, Brussels. Firms, desiring to tender may obtain two sets of the Contract Documents, each consisting of four volumes on and after December 17, 1956, until January 28, 1957, from either the Directorate General of Legal Affairs and Contracts at the Development Board Offices, Baghdad, Iraq, or Messrs. Electrobel Traction et Electricite, 1, Place du Trone, Brussels, Belgium, or the above-mentioned Embassies and Legations on payment of 25 Iraqi Dinars or the equivalent. This sum will not be refunded. All tender documents are to be submitted in English, and they must be accompanied by a deposit of ID. 26,000 (Twenty six Thousand Iraqi Dinars), which must be paid in cash to the Directorate General of Accounts of the Ministry of Development, and the receipt issued for such payment must be attached to the Tender Documents. Such deposit may be replaced by a Bank Guarantee from or through an approved Bank in Iraq. Tenders must be submitted in a sealed envelope endorsed clearly on the outside "Northern and Central Iraq Electrical System-Substations-Tender for Switchgear and Associated Equipment". They must be delivered to the Ministry of Development on or before 12 noon local time on February 25, 1957. If sent by post the tenders shall be registered, but Tenderers must assure themselves of delivery to the Board in due time. A letter of capacity, method of procedure, articles of association, are to be submitted with the tender at the same time. Tenders not submitted within the time specified or not accompanied by a receipt of the deposit or a Bank Guarantee will not be taken into consideration. The attention of the Tenderers is called to the fact that early completion of the project is desired, and, therefore, an early completion date will be considered an important factor in the selection of the successful tenderer. The Development Board does not bind itself to accept the lowest or any tender. Minister of Development.

GOVERNMENT OF IRAQ, THE GRAIN BOARD, MINISTRY OF ECONOMICS, Construction of Concrete Grain Silo and Appurtenant Works at Basrah, Iraq. 1. The Iraqi Grain Board invites tenders for the construction of a concrete grain silo and appurtenant structures at Basrah, Iraq, all in accordance with the specifications, schedules, drawings, and addenda covering the work. A unit price type of contract covering all the required work will be awarded to the successful tenderer. 2. The work to be performed includes but is not limited to the following: a. Concrete Grain Silo of 65,000 ton capacity complete with working house. b. Pier suitable for use by 10,000 ton ocean-going vessels. c. Quay for river craft and barges. d. Two houses for operating personnel. e. Site improvements including railroad spurs, access area paving, electric, water, and sewer lines, grading and walkways. 3. Copies of the documents for tender may be inspected at the following addresses on or after the 5th of December 1956: a. Office of the President of the Grain Board, Ministry of Economics, Mirjan Building, South Gate, Baghdad, Iraq. b. Iraqi Embassies and Legations in Washington, London, Bonn, Brussels and Rome. 4. Copies of documents for tender may be obtained on or after 5th of December 1956 upon payment of ID.35/—(THIRTY FIVE IRAQI DINARS) from: a. Office of the President of the Grain Board, Ministry of Economics, Mirjan Building, South Gate, Baghdad, Iraq. b. Office of the Consulting Engineers, Tippetts-Abbett-McCarthy-Stratton, at 5 Merlin Street, P.O. Box 42 Athens, Greece and 62 West 47 Street, New York 36, N. Y., U. S. A. 5. Tenders must be written in English and shall be enclosed in a sealed package and endorsed clearly on the outside with the words "Tender for Grain Silo at Basrah". They shall be addressed to the President of the Grain Board, Ministry of Economics, Mirjan Building, South Gate, Baghdad, and shall be delivered to the offices of the President of the Grain Board in Baghdad, on or before 12.00 o'clock noon, local time, on 30th May 1957. If sent by post, the tenders shall be registered but the tenderers must assure themselves of delivery to the President of the Grain Board in due time. 6. The tender must be accompanied by a deposit of ID.50,000/— (FIFTY THOUSAND IRAQI DINARS), or the equivalent. Such deposit, if paid in cash, shall be paid to the Grain Board, in Baghdad, or to their order by check drawn on an approved bank in Baghdad, or if made by letter of guarantee such guarantee must be paid from or confirmed by an approved bank in Iraq. 7. Tenders not submitted in the time specified or not accompanied by the required deposit will not be considered. 8. During the time allowed for tender, the Grain Board reserves the right to amend the documents for the purpose of clarification or to reject modifications in the design or in the contract conditions. Any such amendments will be in the form of formal addenda distributed to the prospective tenderers. 9. The Grain Board does not bind itself to accept the lowest of any tender. 10. Tenderers are cautioned that there will be addenda issued prior to the taking of tenders which will cover certain changes occasioned by the necessity of relocating the silo to an adjoining plot of ground. These addenda will not alter the mechanical or structural features of the silo or work house. Nor, on the basis of soil tests performed at the direction of the Board at the new site, will the type of foundation be changed. The changes contemplated in the drawings will cover new topography and appropriate revisions of servicing facilities such as utility connections, access road, rail connection, site grading, foundation details and siting. In addition the types A, C and D Housing are to be eliminated. This will also result in certain modifications to the capacity, location and design of utilities, grading and other auxiliary features. 11. Addenda covering the alterations outlined will be issued on or before 15 February 1957. The approximate location of the silo and appurtenant facilities and of the property boundaries will be staked out at the new site and may be viewed by tenderers after 1 January 1957. The Board having been advised that the chief difficulty in preparing a tender for a structure of this type is in calculating the requirements for the main structure, including machinery, has deemed it advisable, in the interest of saving time, to make available existing information on those features in advance of final designs of the described minor auxiliary features. (Nathir A. Umari) President of Grain Board.

OFFICIAL PROPOSAL

RATE: $2.10 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

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P. O. Box 12, N. Y. 36. January 10th issue closes December 31st

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Associate Civil Engineer with San Luis Obispo County, Pacific Coast midway between Los Angeles and San Francisco. Enjoy Life! Non-metropolitan, no snow, warm climate. Calif. registration not necessary. Ability wanted. Flood Control and Bridge Design experience desirable. $6060 to start for qualified applicant, with Civil Service Security and fringe benefits. Full information contact San Luis Obispo Co. Civil Service, 967 Osos St., San Luis Obispo.

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Teaching appointments for September, 1957, available at university-associated College of Engineering in field of Civil Engineering. Salary and rank commensurate with experience and academic qualifications. Primary teaching field open as present faculty is flexible; preference, if any, would be in sanitary engineering and allied fields. Suburban location, Middle West, adjacent to large industrial center. P-3268, Engineering News-Record.

City Engineer: Unusual opportunity for graduate Civil Engineer or equivalent with professional license in southern Pennsylvania city. Experience essential in land surveying, street and sewer design and construction and related municipal work. Experience desirable in zoning and subdivision control. No structural design is involved. Would be in charge of Engineering Department, supervise survey crew and draftsmen, and would be expected to meet the public as required. Salary range $7,000 to $8,500 with usual benefits. Permanent non-political position for right man. Send resume of training and experience to: Borough of Chambersburg, 100 South Second Street, Chambersburg, Pa. Attention: J. G. Cree.

Engineers and draftsmen structural for steel and concrete design Public Buildings. Consulting Engineers office. Call or write giving training and experience. Saul Shaw & Co., 24 Commerce St., Newark, N. J.

Assist. Prof.—To teach undergrad. courses in structures and applied mech. Salary depends on qualifications. Dept. of Civil Eng., Univ. of No. Dakota, Grand Forks, N. Dak.

Office Engineer and Assistant Engineer (two positions), desired for progressive Class 1 New England Railroad. Immediate placement for men with proper qualifications. State age, references, experience, education, salary required, when applying. All correspondence confidential. P-3730, Engineering News-Record.

Equipment Maintenance Superintendent. A challenging position is now open to the right man to take charge of one of the largest fleets of on and off highway trucks, bulldozers, cranes, shovels, and other contractors' equipment in the United States. Please write, giving employment history and salaries earned. P-3735, Engineering News-Record.

ENGINEERS DESIGNERS

Challenging opportunities for career-minded men experienced in

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Send resume to

2500 South Atlantic Boulevard, Los Angeles 22, California

The Fluor Corp., Ltd.

ENGINEERS — CONSTRUCTORS

POSITIONS VACANT

Chief Estimator — Eastern Massachusetts must be able to take complete charge of estimating department of building division of large construction firm. Please furnish resume of qualifications and salary requirements. P-3691, Engineering News-Record.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'s and engineers considered. Full information and references in first letter requested. P-3116, Engineering News-Record.

Designers—Steel, Concrete, Electrical Piping, Air-Cond., Power Plants & Industrial Bldgs. Marbarry Corp., 120 Greenwich St., N.Y.C. Rector 2-3749.

Graduate Civil Engineers not over 30 and preferably single. Must have military training completed and interested in the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $100.00 per week if unexperienced with higher wages for those with some experience. Send complete history data. Martin K.-Eby Construction Co., Inc., 610 N. Main, Wichita 2, Kansas.

Field Superintendent: Reliable General Contractor with forty year clientele interested in contacting experienced field superintendent for handling large and moderate size construction jobs within 300 mile radius of Chicago. Apply P-3650, Engineering News-Record.

Wanted: Job Superintendent for midwest building construction company. Age 30 to 50. Salary and bonus if qualified. Submit education, experience, qualifications, starting salary. P-3633, Engineering News-Record.

Civil Engineers, Designers, Draftsmen experienced in the design of sewers pumping stations, sewage treatment plants, water supply systems, structural and hydraulic design, hydraulic computations, specs. O'Brien & Gere, 100 E. Genesee St., Syracuse, N. Y.

(Continued on page 81)

HIGHWAY ENGINEERS

NEW OPENINGS
IN THAILAND

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Soils Engineers
Bridge Construction Inspector
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Must have college background and recent highway experience. Interviews arranged immediately for those qualified.

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Prefer several years or more experience in any of these fields:

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Field Engineers with refinery or related construction experience.

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Industrial Relations Division

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In New York City and New Jersey

BROWN & BLAUVELT

468 Fourth Avenue, New York City

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••CIVIL ENGINEERS••

Minimum 3-5 years experience in structural design and construction of offshore structures, piers, drilling platforms, etc. Supervisory experience and ability to prepare economic and technical studies essential. Graduate civil engineers needed by major oil-company operating in Venezuela. Salary commensurate with experience.

SUBMIT RESUME TO:

P.O. BOX #35
Bowling Green Station
New York 4, N. Y.

SALES ENGINEER

CONSTRUCTION EQUIPMENT

Opportunity for sales engineer work for energetic young engineer or construction man. 25 to 35 years of age for sales work in established territory with company operating on nation-wide basis furnishing metal forms for sale or rent to handle concrete forming work. General construction experience or some civil engineering training desirable. Must want to sell. Give full details of background and experience in first letter to W. H. Witt.

Economy Forms Corporation
P. O. Box 128, H. P. Station
Des Moines, Iowa

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New positions created in Madison, Wis. Graduate engineer with some experience to begin in Engineering Dept. at about $455 a month. Annual and longevity increases to $563. Office and field work in design and construction of sewer, water, street, sidewalk and curbs. Possession of Engineer-in-Training Certificate required. No residence restrictions for man to begin work. Wisconsin Retirement Fund and Social Security Benefits. Personnel Dept., City Hall, Madison 3, Wis.

POSITION AVAILABLE

GRADUATE STRUCTURAL ENGINEER with minimum of three years experience in structural design office. Age 30 to 40 years. Headquarters Chicago. No traveling. Opportunity for advancement. Salary open.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue Chicago 10, Illinois

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Experienced on Highways and Bridges to work for a progressive and expanding construction company, man of/or with good references desired. Please send complete resume to:

FISCHER CONSTRUCTION COMPANY
4053 Clifton Ave. Cincinnati 20, Ohio

RESIDENT ENGINEER

Expanding metals manufacturer adding to Construction Engineering Division requires 2 competent graduate Civil Engineers to handle large building construction projects in this country and overseas. Should have thorough construction supervisory background preferably in industrial buildings. Should be available next 30-60 days. In confidential letter give age, education, experience, and salary required.

P-3793, Engineering News-Record, Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

STRUCTURAL ENGINEER

Large New England fabricator has permanent position for young structural engineer—position will eventually lead to Chief of Engineering Department. Must have Conn. C.E. license or qualifications to take examination. Give full qualifications in letter.

P-3750, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

ENGINEERS

Key positions open for experienced Engineers to be in responsible charge of individual projects with excellent opportunities for advancement.

CIVIL OR SANITARY ENGINEER to Design Sewage Treatment Plants and Sewage Works.

STRUCTURAL DESIGNERS experienced in Concrete and Steel Design of Sewage Treatment, Water Treatment Plants, or the design of Hydraulic Structures in connection with Dams.

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Also key positions for:

HYDRAULIC ENGINEER experienced in Earth and Concrete Dam Design.

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Ideal living conditions. Vacations and sick leave, Bonus, Insurance and Retirement Benefits.

Send complete resume to—

GANNETT FLEMING CORDDRY & CARPENTER, INC.

P. O. Box 366 Harrisburg, Pennsylvania

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FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

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P-3801, Engineering News-Record,
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(Continued from page 79)

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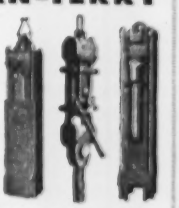

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For Better Dams

A MATCHLESS OPPORTUNITY to compare basically differing dambuilding techniques and to exchange important knowledge bearing on both design and construction of mass concrete dams is continually unfolding on the international St. Lawrence power dam.

Canadian theory and practice in the field of large concrete dams, primarily developed by experienced engineering forces of the Hydro-Electric Power Commission of Ontario, is not unknown to U. S. engineers and construction men. But never before has there been such an opportunity—so rare that it may never again occur—to observe on a single, large structure the differences between contrasting techniques.

On p. 30 of this issue, the vital difference between steel and wood draft-tube forms is stressed. In past articles the winter concreting methods have been contrasted. There remain still other parts of the story, which will be told as the pieces unfold through yet another big year of concreting on the project.

It is not too much to expect that out of the opportunity thus offered to study again the long-recognized and often-argued differences in dambuilding concepts on the two sides of the border will come changes to benefit dam construction everywhere. It is an opportunity that should not be missed!

Upgrading the Technician

HOW CAN ENGINEERS BE UTILIZED more efficiently? Where will the technical manpower come from to handle expanded programs? These questions were answered in a specific way in ENR's special report on engineering manpower (Nov. 8, p. 28). And now a prime example develops in a state highway department, one of the agencies to be affected most by expanded demands on existing manpower.

The California highway department is inaugurating a program which department officials believe will be of substantial help (ENR Dec. 13, p. 80). They have established civil service classifications aimed to encourage technicians to make a career of highway work on the subprofessional level.

Under the plan, technicians may start at the bottom as high-school graduates with no formal training, or they may start at a higher level as graduates of two-year terminal courses offered by technical institutes and California junior colleges. Either way, they can now advance step by step to a subprofessional grade equivalent to the lowest professional grade requiring engineering registration. And, if they are able to obtain engineering registration, they can advance even higher.

Thus, by providing paths for advancement, California officials hope to encourage large numbers of subprofessional men to work for (and stay with) the state highway department. The program will permit better utilization of experienced engineers by relieving them of routine work in surveying, inspection and drafting. It will also permit the young engineer to be assigned, at the start to tasks aimed at his development and advancement.

Moves such as this have been opposed in some quarters in the past on the grounds that subprofessionals will be doing the work of professionals. This is the shortsighted view. Rather, the position of the professional engineer should be greatly enhanced by confining his duties to those which only he can perform. And in addition, the greater opportunity for the technician to gain stature can only strengthen the whole profession.

The technician will augment professional work, not perform it. He will support but not supplant the graduate engineer—although nothing but good can be envisioned from those cases where technicians become capable engineers. The overall result should improve not only the professional status, but the economic position of engineers as well.

California's enlightened program should show how to increase a highway department staff, and thereby get more efficient use of trained engineers—more engineering per engineer.

Fumbling with Fluoridation

THE BIGGEST CITY in the land is a leader in many more things than mere size. And yet, perhaps in part because of its size, it can also trail far and sadly behind in certain other municipal advances and improvements. New York's position on fluoridation of water is a case in point.

While hundreds of communities over the years have adopted fluoridation of their water supplies as a proven, safe, economic way to cut tooth decay, New York City has stood by, inactive. Only now, with fluoridation a hot subject for at least the past ten years, the big city seems on the verge of doing something about it. Or is it really about to act? And what might it do? Its Health Department says, "Fluoridate." Its Department of Water Supply, Gas & Electricity, says, "Don't Fluoridate." Its mayor and council, instead of settling the issue, have mumbled none too distinctly about a referendum.

Fluoridation is either good or it is bad. It has been judged good by dental and medical authorities. The nation's second largest city, and the third, and the sixth, seventh, eighth and ninth have adopted it as a dental-health benefit their water suppliers should provide. In all, some 30 million Americans in over 1,400 communities have the advantage of fluoridated water. And in only a reported 62 cases was fluoridation put to a referendum.

It is too late now for the biggest city to set an example by acting favorably on fluoridation. But there is still time for its administration to adopt the practice and avoid the stigma of being in the rear guard of a demonstrated advance.

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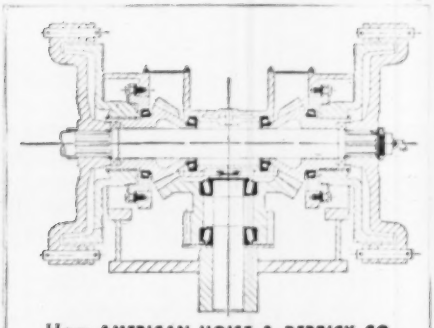

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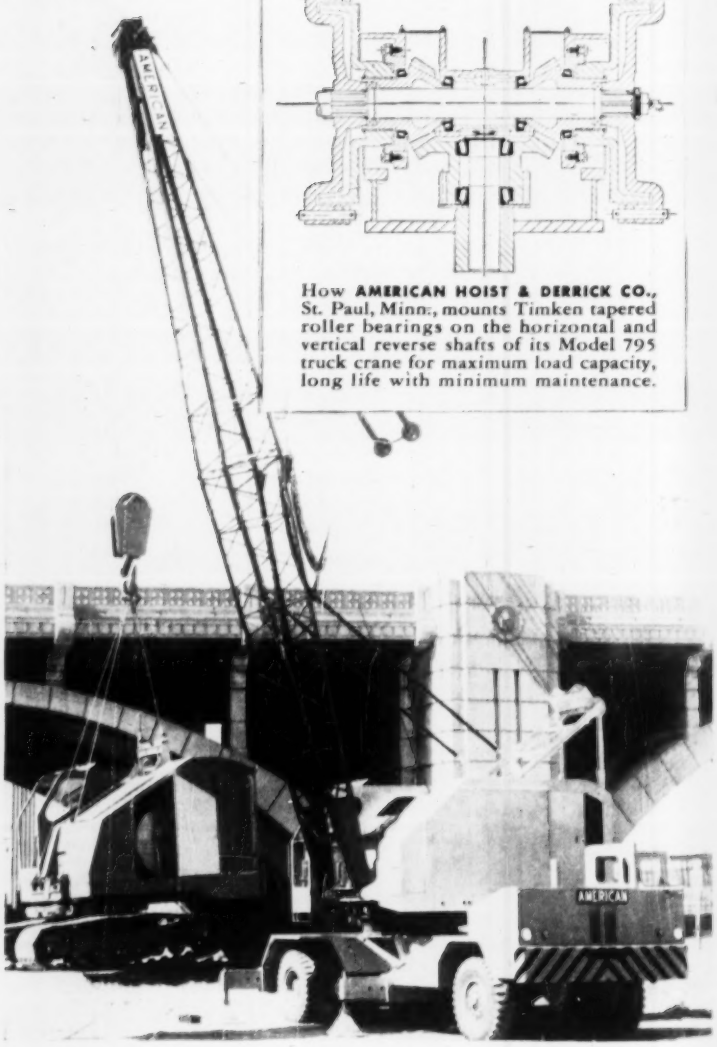

THIS versatile American truck crane handles four tough jobs as crane, shovel, backhoe and dragline. The picture shows an unusual use for this 45-ton crane. Loads on the shafts and gears in the drum assembly are very heavy. And these crane units must operate steadily at maximum capacity with simple, easy maintenance. That's why American Hoist & Derrick Co. uses Timken® tapered roller bearings in vital positions—drum shaft, horizontal slewing shaft reverse gears, vertical slewing shaft, retract shaft gear hub, retract shaft intermediate gear, and independent travel vertical drive shaft.

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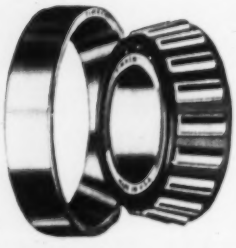

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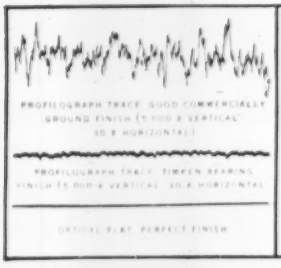
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